



FRIDAY, JANUARY 3, 1879.

Contributions.

The Slide Valve and Link Motion.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The discussion of the motion of the slide valve is a subject which I apologize for re-opening, and only say in defense that there seems to be room left for this mode of treatment. Originality is not claimed for any portion of the work, and the only attempt made is to free the process from mathematical and geometrical perplexity.

The discussion of the motion of the valve when once in use, and the mode of writing its autograph by the apparatus designed by Mr. Forney has been given completely in the pages of the *Railroad Gazette* and the "Catechism of the Locomotive," and leaves little room for the discussion of valves once built; but in designing for new classes of engines, even this method, with those of Mr. Auchincloss, in his valuable work on the link motion, are found to be inconvenient, compared with the more comprehensive methods of Zenner and Rankine. A very good adaptation of these latter is given by Mr. E. J. C. Welch, in a little book entitled "Designing Valve Gearing," published by E. & F. N. Spon; but this work is written in a very geometrical style—that is, in the form of proposition and theorem—which, possessing many advantages, yet seems calculated to drive away many readers, and the diagrams given have an air of complexity which I shall hope to avoid.

In order fully to understand the methods, we shall begin with the simple engine with one eccentric, and afterward pass to the more complex link motion.

In the engine given in the skeleton diagram of fig. 1, it is well known that the motion of the two ends of the connecting rod is not regular; that is to say, that for equal



Fig. 1.

changes in the position of the crank the changes in the position of the piston-rod are not equal, and also that for equal changes in the position of the piston-rod the changes in the position of the crank are unequal. There is also a difference in the changes at one end of the stroke compared with those made at the other end, and this latter irregularity is more trouble than the former.

In order more fully to illustrate this, the skeleton sketch, fig. 2, is made, 1, 2, 3 and 6, 5, 4 being similar positions



Fig. 2.

with regard to the crank; the same numbers at the piston-rod end show the irregularity.

As the movement of the valve with regard to the eccentric is of exactly the same kind as that of the piston rod to the crank, we must examine this irregularity, and we find it decreasing very rapidly as the connecting rod is lengthened if the crank be the same, or if the connecting rod remain the same while the crank is shortened.

The motion of the slide by a rock shaft at some distance is a merely horizontal motion; while the lower rock arm performs the same movements as the upper, only reversing the direction of the motion, the eccentric rod and eccentric arm move exactly as the connecting rod and crank. (In fact, an eccentric is sometimes spoken of in regard to its motion as a crank with a small throw and a large pin.)

In studying the valve movement, as the length of the connecting rod is not always the same when compared with the crank, it will be found easier to refer the position of the valve to the position of the crank instead of the piston, as then we shall only have to look at one irregularity at a time, and the first of these, that due to the valve rod, is so small that we may rightly neglect it. For example, with a 5-in. throw and 50-in. rod, it is only 1 two hundredths of 1 in. The position of the piston with regard to the crank is so easily found when wanted that we will omit it altogether and confine ourselves to the valve motion referred to the crank alone.

The position of the valve with regard to its eccentric can, if the valve-rod is long, be found with sufficient accuracy by finding the position of the eccentric-arm in one direction only. Thus, if in fig. 3 we wish to find the place of the valve with regard to its stroke, we do so by dropping a perpendicular



Fig. 3.

lar from the end of the eccentric-arm upon the line of the motion. AB is the travel of the valve or throw of the eccentric in the line of the motion, and CD is the position of the eccentric arm, C being the centre of the shaft and D the centre of the eccentric. To find the position of the valve, draw DE perpendicular to AB ; then will CE be the distance the valve is from its middle position and EB and EA the distances from the end of its stroke in either direction. By combining this with the position CF of the crank, we see

that if one is given with the angle between the crank and eccentric arms we have also the other by this construction. A convenient method of examining the whole motion at once is found to be the laying out on CD the distance $CG = CE$, or, better yet, by laying on the crank arm $CH = CE$, and changing the point H or G as the crank is turned round.

We will take a portion of fig. 3 on a somewhat larger scale in fig. 4, and make the construction for different positions by laying upon the eccentric arm the amount the valve has moved from the centre for that position of the eccentric. In doing this we see at once that if there be drawn, from the end of the travel or the diameter which is in the line of the motion, a perpendicular upon the eccentric arm AF , the distance $CF = CE$, which is the required travel from the mid-



Fig. 4.

dle position. Make $CF = CE$ on the crank arm instead of the eccentric arm. By drawing these for different positions of the crank, it will be found that the point F always falls upon one of two circles whose centre is at C , distant from C one-half of CA , or at H the same distance the other side of C and on the line AB . This statement may be verified by trial or demonstrated by the reasoning that AF is always a right angle, and may, therefore, always be drawn in a semicircle.

The same centres moved over from G and H to I and J will be the centres of circles on which the point F must always lie; the angle ICA is that between the crank and eccentric arms, for when the crank is at I the eccentric is at C and the valve is therefore farthest from the middle. We shall call these last circles the distance circles.

We are now in a position to state our first problem. Given the angle between the crank and eccentric arms and the travel of the valve, to find the position of the valve for any position of the crank.

Lay off in fig. 5 $AB =$ the full travel of the valve, and bisect it in C . Lay off $DCA =$ the angle between the

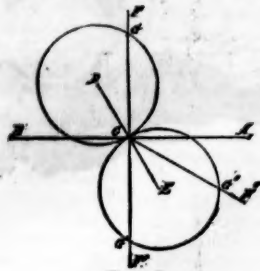


Fig. 5.

crank and eccentric arms, and make $DC =$ one-half CA , and produce DC to E , making $CE = CD$. Draw two circles from D and E as centres, making the radii $= CD$. These are the distance circles. For any position of the crank, as CF , CF' or CF'' , the amount the valve has moved from its middle position is given by the distance from C to G , G' or G'' , where the crank arm cuts the two circles. If the crank arm cuts the circle D , the eccentric is to the right of C ; if the circle E , to the left of C . The position of the valve will agree or differ with that of the eccentric if there is or is not a rock shaft used, as far as being to the right or left of its middle position is concerned.

Now this construction is not any better than the one given before for any given position of the crank, but the two distance circles once drawn it is easier to follow the intersection of the crank arm with them than to repeat the other construction. In other words, it is more comprehensive. We shall soon see that it may be made very useful.

As the slide valve is usually constructed, see fig. 6, when placed in its middle position, it completely covers both steam ports and projects beyond them. The name given this projection is steam lap or lap, and it also projects toward the



Fig. 6.

exhaust port a little. This is called exhaust lap. These names are used to denote the amount of these projections as well as the projections themselves.

It is evident that the ports cannot be open to the steam until the valve shall have moved from the centre an amount equal the steam lap, nor can the port open to the exhaust till the valve be moved from the centre a distance equal to the exhaust lap; and if we measure these distances off on the crank arm, it will, with them, as it swings round, describe two circles which we will call the lap and exhaust-lap circles; their centres will be at the point C in figs. 4 and 5. Combining these with the method just given, we are ready to answer our next question, which is this: During what portions of the revolution is the cylinder open to the steam, what portion open to the exhaust, the travel laps and angle between the crank and eccentric arms being given?

Lay off in fig. 7 the travel AB , bisect it in C and draw the line DCE , making the angle $DCA =$ the angle between the crank and eccentric arms, and draw the two distance circles through C with radii $= \frac{1}{2} AB$ and centres at D and E exactly as in the last construction. With the steam and exhaust laps as radii, draw portions of circles from C as a centre, cutting the distance circles, and draw the eight lines from C through the points of intersection. When the valve distance is greater than the lap circles, one side is open to the steam, the other to the exhaust; when the valve distance is less than the steam lap, the steam is closed at one

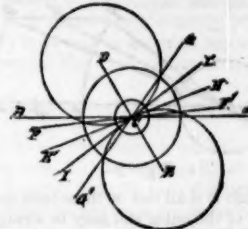


Fig. 7.

end and the exhaust at the other end is open or closed as the valve distance is greater or less than the exhaust lap. From G to F the steam is open at one end, and from G' to F' at the other end. From I to H the exhaust is open at the other end, and from I' to H' at the first end.

When the valve has moved to the right, the right exhaust port and left steam ports are open; or, in other words, the right end of the cylinder is open to the exhaust and the left end to the steam. When the valve moves to the left, the left end opens to the exhaust, the right end to the steam.

The valve moves to the right, if there be no rock shaft, when the crank cuts the circle D , and to the left when it cuts the circle E . When there is a rock shaft, the movement of the valve is reversed as far as being right or left of its middle position.

In this problem there are various things concerned, first, the angle between the crank and eccentric arms; second, the travel of the valve; third, the position of the crank when the steam opens; fourth, the steam lap; fifth, the position of the crank when the exhaust opens; sixth, the exhaust lap; and with these same distance and lap circles we can solve other important questions, and we will introduce one or two without giving any special demonstration of our construction.

Given the travel and points of opening and closing to the steam, to find the angle between crank and eccentric arms.

Set off in fig. 8 the travel AB , and draw the two positions of crank when the ports are to open and close to the steam

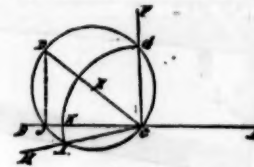


Fig. 8.

CF and CH ; bisect the angle FCH by CD ; then will DCA be the required angle between the crank and the eccentric arms.

Given the travel of the valve, angle between crank and eccentric, and points of closing to the steam, to find lap.

In fig. 8, set off $AB =$ travel; bisect it in C and lay off $ACD =$ the angle between crank and eccentric; draw the distance circle from E as a centre through C , with radius $CE = \frac{1}{2} AB$; and draw CF : the required position of crank at point of cut off CG from C to where CF cuts the distance circle is the required lap, and by drawing the arc GI , with GC as radius and C as centre, we find it cutting the distance circle again in I . CH from C , through I , is the position of the crank when the steam opens, and the distance JK , which is the amount the valve is open at the end of the stroke, is called the lead. If this opening be thought too great, or the position CH too soon before the end of the stroke, the eccentric must be moved on the shaft, and the lap, of course, found again. As DC always bisects HCF , this presents no difficulty. DJ is always at right angles to AB , and this will help in the next problem.

Given the travel, lap and lead to find the cut-off.

Set off in fig. 8 the travel AB , the centre C , and the distance $CK =$ the lap, and also $KJ =$ the lead. Draw JD at right angles to AB , and make $CD = CB = CA$ by taking CA as a radius and cutting JD by an arc from C as a centre. Bisect CD in E and draw the distance circle through C and D with radius $EC = \frac{1}{2} AB$ and E as centre. Swing CK as a radius and C as centre, cutting the distance circle in I and G . CI is the position of opening and CG of closing to the steam.

A little practice with this method, first upon actual valves and then by combination of the foregoing problems, introducing also the exhaust, will soon give a facility not easily obtained by the common methods.

There is yet one case with a common slide-valve which will require some attention, as it is a specially good introduction to the link motion, and that is when the eccentric rod and valve rod are not parallel or in the same line, as sometimes happens when the steam chest is on top of the cylinder and there is no regular rock-shaft used, the steam chest being to one side of the centre of the cylinder, as shown in the skeleton sketch of fig. 1, by the dotted line, which is the eccentric rod. The action of an oblique connection is so seldom fully explained, or at least so seldom fully understood, that we may be excused for giving it some attention, and, as it must be understood in the common link

motion, we will consider again the action of a crank and connecting rod, which will now be taken in general.

It is clear that the farther end of the connecting rod can come no nearer the centre of the crank shaft than the difference in length between the rod and crank, and can go no further from it than the sum of the length of the crank and rod; and these are absolutely the only limits as far as the crank imposes them.

Thus if in fig. 9 CA and AB be the crank and connecting rod lengths, by drawing from C as a centre two arcs with radii equal the sum and difference of CA and AB , the only limits

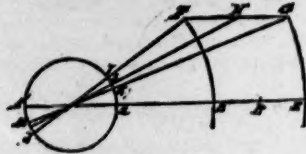


Fig. 9.

to the stroke is that it shall end on these ones, and lie between them. The path of the outer end may be straight or curved in the case in point. For slide valves it is usually straight or very nearly so, and is called the line of the motion. Suppose it straight; then it can be seen that the length of the stroke for a given crank can be varied considerably, as for example at DE and FG , the latter being plainly the longer. But another feature is also presented, that is, for a uniform revolution of the crank the times of forward and backward strokes, which are the same for DE , are not equal for FG , because the dead points when the motion changes, which always occurs when the crank and rod are in the same line with each other, are for the stroke FG at the points J and K , which are not on the same diameter, and it will

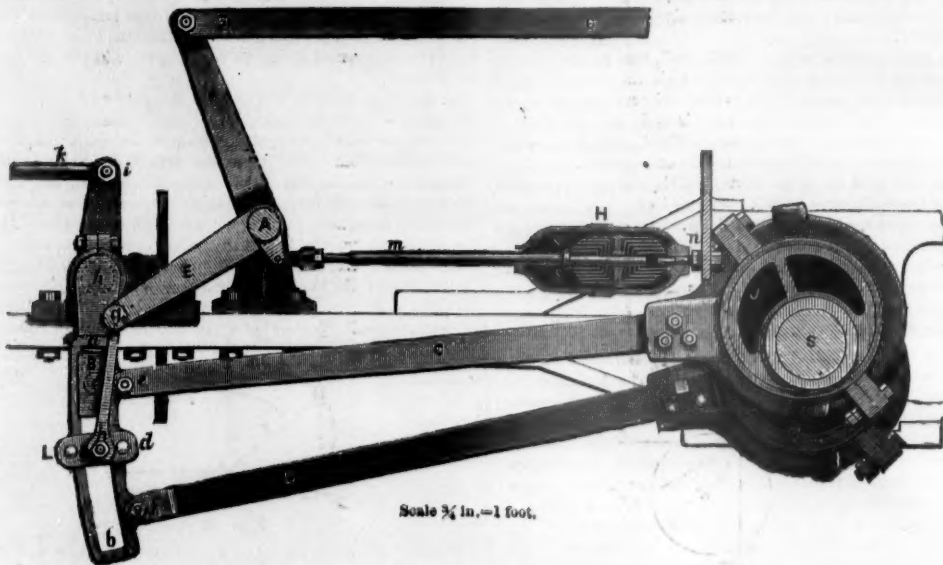


Fig. 10.

take longer to pass from J to K and F to G than from K to J and G to F , the revolution being right-handed. This is taken advantage of as a "quick return motion" in some slotting machines. If now the middle of the stroke FG at H be found and the straight line $HLCM$ be drawn, the dead points K and J will not lie on this line, but near it, and the longer the rod is, compared with the crank, and the smaller the angle ECH , the closer will be the agreement; and when the crank is on this line the other end of the connecting rod will be very close to the points F or G , as the case may be; and if the motion were studied on the line AE only, being a parallel to FG passing through C , it would take place as if moved by a crank arm CA instead of CL , which is at the angle ACL from the other; and in fact we can call CA an equivalent crank for CL , for it will cause the stroke DE to be made at the same time as CL moves FG , the rod coming to D in one case when the other comes to F , and to E when the other arrives at G .

In applying the diagram for the valve motion to an engine of this kind, the only change we have to make is that instead of using the actual angle between the crank and eccentric arms we must use the angle between the crank and the equivalent eccentric arms, that is, it must be changed by the angle between CA and CL or ACL , that is to say, by the angle at the centre of the crank shaft between the average dead point L and the line parallel to the "line of the motion," on which we have heretofore supposed the dead points to lie. This change will be an increase or decrease in the angle between the travel line and the line through the centre of the two distance circles, according as the rotation is right or left handed, there being no rock shaft used.

Such engines are not very common, but the chief objection to their use would be the necessity of guiding the end of the valve rod, as the irregularity noted above is very slight and has most influence when the valve is fully opened and very little when opening and closing the ports. Such a motion properly applied would prove very convenient in certain cases, though very rarely for locomotives, and it has sometimes been used, though but seldom in this country.

In the foregoing we have considered only the action of the slide valve when moved by a single eccentric, and the introduction of the oblique eccentric rod was only for its use in the most complicated case of a valve moved by two eccen-

The usual mode of connection is to join the ends of two eccentric rods by a slotted piece called a link, in which a sliding piece moves and which itself gives motion to the valve by a rod with or without a rock arm. The position of the slider with regard to the two ends of the link regulates the amount and time of the movements of the valve in a highly complicated manner, which, however, can be approximated very closely by comparatively simple methods.

There are three kinds of link motions in use: 1, That in which the link as a whole is moved over the slider when changes of the valve action are made; 2, that in which the slider is moved along the link when changes of the valve action are made; and 3, that in which both link and slider are moved to accomplish this object. These are called the Shifting, Fixed and Straight Links respectively. The two former are curved in arcs of circles which are concave toward and from the shaft as the link is shifting or fixed, and the name of the last is taken to distinguish it from them. All of these links are used with locomotives, but in the United States, from the universal practice of using outside cylinder engines with the steam chest on top of the cylinder, it may be fairly said that the shifting link used with a rock shaft is the only one likely to be followed. For steamers and stationary engines the fixed link is sometimes more convenient, and the straight link is rarely met with. As our object is mainly to help locomotive men, we will confine ourselves to the common shifting link.

Fig. 10, from the "Catechism of the Locomotive," shows so clearly the arrangement of the parts that no description of them will be here given.

Taking, for the sake of clearness, a straight bar between the ends of the two short eccentric rods in the skeleton drawing of fig. 11, let C be the centre of the crank shaft and E and E' the two eccentric centres, L and L' the two

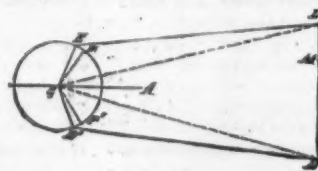


Fig. 11.

centres of the joints between the two eccentric rods and the link, and LL' the centre line of the link. Now the centre of the rock shaft does not move, being connected to the engine frame, and therefore a line from C to the end of the lower rod which carries the slider does not as a whole move; suppose it to be CA , which then becomes the line of the motion, and because CL and CL' both make angles with CA , both ends of the link come under the head of points moved by oblique eccentric rods, and we have to find virtual or equivalent eccentrics for each end of the link and for each position it has with regard to the slider. But this is not a difficult matter; for if the link be dropped till L comes down to the slider, E is its own virtual eccentric, while E' has to be moved to F' , so that $E'CF' = ACL' = LCL'$ for this particular case; and if the link be raised till L' comes on the slider, E' is its own virtual eccentric, and E is moved to F , which is then so that $ECF = LCL'$. We shall call LCL' the link angle. Now for any other position of the link, as that drawn in fig. 11, the angle $ECF = LCA$, and $E'CF' = L'CA$, and the sum of ECF and $E'CF'$ must equal $LCA + L'CA = LCL' =$ the link angle. Hence ECF' is a constant angle, and it is swung around C as a centre as the link is raised; and if the link be divided into any parts the link angle is divided into the same parts, and they are set off from E and E' very easily. The link is of course curved to keep the middle position of the valve over the middle of the ports, while the link is raised or lowered. The motion of the points L and L' are then exactly as if they had been on the line CA and moved by the points F and F' , being the virtual forward and backward eccentric centres; for E comes to its dead points when F comes to CA , and also E' to its dead points when F' arrives at CA , the dead points for E and E' being on or very near the lines LC and $L'C$, respectively.

We have then established for the points L and L' what are called the virtual forward and backward eccentric centres, whose motion is to be considered and not the motion of the real eccentrics, and we now come to the motion of any point in the line LL' ; for instance, the point M . The motion of M can be found by considering that if L be fixed while L' moves, M has a definite movement, and also that if L be fixed while L' moves, M has also a definite movement; but as both L and L' move at the same time, M must have its motion from each as before, and hence the sum of these two separate

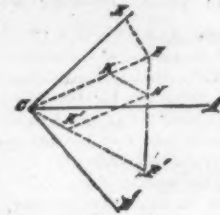


Fig. 12.

effects at the same time. Now enlarging part of the figure to avoid confusion and using the virtual eccentrics F and F' instead of E and E' , as it has been shown we must do, we have fig. 12.

We see that if L' be fixed and $E'L'$ disconnected, and CK be made the same part of CF that $L'M$ is of $L'L$, the point M will move as if driven by an eccentric with a centre at K and a rod CK ; and also that if L be fixed while $E'L$ is disconnected and CK' be made the same part of CF' that $L'M$ is of $L'L$, the motion of M would be as if derived from an eccentric centre at K' by a rod CK' . To combine these two motions at once, draw KN equal and parallel to CK' , and the point N will revolve about K as K' does about C , and also draw $K'N$ equal and parallel to CK . Then does the point N revolve about K' as K does about C , and either way we look at it N revolves about K while K does about C , or it revolves about K' while K' does about C ; and hence the point M moves as if directly connected to N by a rod MN , and the point N may therefore be called the virtual eccentric centre and CN the virtual eccentric arm for the point M . It is also seen that the point N is on the line FF' and divides it in the same proportion that M does $L'L'$, for the triangles FKN , $NK'F'$ and FCF' are all similar and the line FF' may be drawn and N found by making FN the same part of FF' that ML is of LL' . This is an easier construction than the one given, which is intended only for demonstration. It may be necessary to caution the reader that the motions

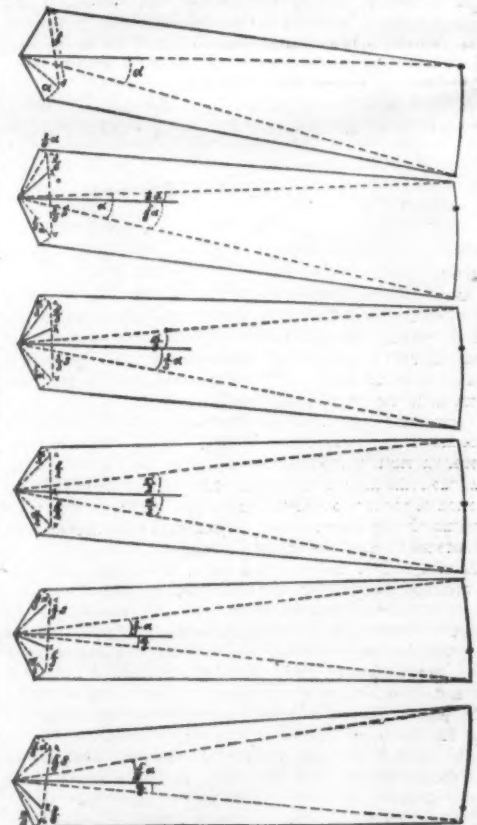


Fig. 13.

spoken of are all taken on the line CA , which is the "line of the motion," and are only true on this line or on lines parallel to it.

If the link is of the fixed kind, the virtual forward and backward eccentrics are found once for all, and the point N on the line FF' moves in a straight line between them only; but in the shifting link the whole link is moved about the line of action, but as the only point in LL' which we have any use for is that which is the centre of the slider or where LL' is cut by CA produced, we find that the point N moves down FF' as the link is raised, while also ECF' swings about C at the same time, and that the angle swung over is the same part of the link angle LCL' that FN is of FF' and that LM is of LL' . The accompanying fig. 13 shows some of these positions.

This enables us to see that if the points E and E' were gained by a curve, the single virtual eccentric centre N



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RAILROAD CONSTRUCTION IN 1878.

We present this week a tabular statement of the new railroads completed in the United States during the year 1878, so far as we have been able to ascertain. The detailed description of each road and part of road which we are accustomed to give will appear later, and will doubtless show some changes, which will be mostly additions, as we make this table earlier than usual, and with the greatest possible care it is not practicable to get complete and accurate information so early in the year—very difficult, indeed, to get it at any time of the year. Our aim has been, as heretofore, to include all new road on which track was laid during the year, whether opened for traffic or not, and only that.

During the year, as we have reported from week to week, the mileage has been generally quite near that of 1877, in the latter part of the year sometimes exceeding it and sometimes falling short. But now at the close we find the total to be considerably greater, not only than in 1877, but in any previous year since 1873. The totals constructed each year according to our records (which for past years vary but a very few miles from the exact truth, having been corrected from year to year as information has been received) have been:

1872.....	7,340	1876.....	2,450
1873.....	3,883	1877.....	2,281
1874.....	2,025	1878.....	2,688
1875.....	1,561		

At the beginning of 1878, according to Poor's Manual, there were 79,208 miles of railroad in the country. The addition of 2,688 miles is equivalent to 3½ per cent., while the yearly increase in population is probably not 3 per cent., even when immigration is large. According to this, there are 81,896 miles of railroad in the United States at this time, and the population of the country according to the estimates of the expert officers of the last census, is about 48,000,000. This gives about 585 inhabitants per mile of railroad—a much smaller number than in any other country on the globe. Of all European countries Sweden has the largest mileage in proportion to population, and there a mile of railroad has 1,667 inhabitants to support it, or nearly three times as many as in the United States. In the whole of Europe in 1876 there were 3,333 in-

habitants per mile of railroad, or nearly six times as many as in the United States.*

This is a rapid enough progress in railroad construction. It only appears small in comparison with the gigantic work of 1872 and the few years preceding, when additions were very largely of roads in no way required to meet the needs of the country, actual or soon probable.

It may be said of the extensions of 1878 that they were parallel with a great increase of production, and an examination of their situation will show that the largest part of them were just where production has recently increased most rapidly and promises to continue to increase in the immediate future at least. In the short table headed "Recapitulation by Sections" it will be seen that in the states called "Northwestern" (being really "Central Northern"—those of the upper Mississippi valley west of the Lake and Indiana) the number of miles of new road is twice as great as in 1877, and greater than in any other year since 1872. Of the total constructed in 1878, 46 per cent. was in these states, which had less than 30 per cent. of the total in 1877. Even this does not show to how great an extent the work was Western. Of the 2,688 miles, 1,541 were west of the Mississippi River, and this in spite of a large decrease on the Pacific coast, where construction had been quite active for a few years before. Perhaps more remarkable even than the number of new roads in the fertile prairie states, where the occupation of all the land and a large agricultural population are only a question of time, is the construction of lines here and there, generally far separated from other roads, through the vast interior districts between the 100th meridian and the Sierra Nevada—plains and mountains, a country where most of the land is fit only for grazing, if at all serviceable, but capable of producing cattle for the world, and with great riches in mines, which already occupy a considerable population—capable, doubtless, of sustaining a very large population, if much less dense than that of the rest of the country, and of yielding a profitable traffic to a limited number of railroads. More than an eighth of the mileage of 1878 is in this territory. Two territories, Arizona and Idaho, have their first railroads in 1878, and a third, New Mexico, has been attacked, the Atchison, Topeka & Santa Fe having begun a tunnel which will lead into it from Colorado. There remain now only it and Montana wholly without railroads, and both of these will probably be reached in 1879 or 1880 at farthest. Evidently all this wild, waste country, more extensive by itself than most countries, is about to be made available, so that its capacities, whatever they are, may be developed. The mining districts gain immensely by having the railroad at their doors; but the soil in these territories is made available as soon as the railroad is within 200 miles or more. The cattle and wool which are almost its sole products for export, can be moved great distances to market without great cost, and often are. A comparatively small mileage, therefore, will supply these territories adequately. Apparently, the result will be a few long lines connecting the chief mining centres, and about these latter little radiating systems of short roads to serve the mines, such as already exist about Denver, and to some extent in Utah.

While the West goes ahead, the East and the South fall back. Not one of the groups of states east of the Mississippi and south of the Ohio and of Missouri but has constructed less railroad in 1878 than in 1877. These are the first six groups in our "Recapitulation by Sections." Last year they constructed 1,167 miles of new railroad, or 51 per cent. of the whole; this year they have constructed but 978 miles, or 36 per cent. of the whole. The decrease in amount, however, is not great, and has no particular significance. It has not been difficult to build new roads where there was any prospect of getting traffic for them, and less so in the East (not in the South, however) than elsewhere. The mileage of 1877, too, was swelled by an abnormally large construction in Ohio (269 miles against 97 this year), where there were before more railroads than could get a living.

Minnesota leads this year with its mileage of new railroad, having completed no less than 338 miles, or 13 per cent. of the whole. This is more than in any previous year, we believe, and considering the fact that but a few years ago not one of the Minnesota railroads made large enough profits to pay the interest on its bonds, and that several did not earn their working expenses, it is certainly remarkable. Doubtless it is largely, if not chiefly, due to the abundant wheat crop of 1877, which attracted a heavy immigration and made a market for the fertile Minnesota lands, of which great quantities are owned by railroad companies and by the government. Probably all, or nearly

* See the Journal of the Prussian Statistical Bureau, last quarter of 1877, page 290.

all, these Minnesota roads will have a paying traffic in course of time, but not so soon as if the last harvest had turned out well. There had been a large immigration before the harvest, however, which is likely to add largely to the area in cultivation in 1877.

One of the new Minnesota roads—the St. Vincent Extension of the St. Paul & Pacific—is especially important as giving an outlet to the growing Canadian province of Manitoba and to an immense territory capable of producing great crops of wheat, though with so severe a climate that it is doubtful whether there will be any great production there so long as there is an abundance of fertile land in more genial climes. This year, too, a third railroad crossed the western border of Minnesota into Dakota. The mileage completed in the state in 1878 is more than the aggregate in the four previous years.

Next to Minnesota in mileage constructed comes Iowa, the state next south, and Missouri, the state next further south, is third in the list, these three states on the west bank of the Mississippi having together added 703 miles to their railroads, which is more than a quarter of the whole. The states which have constructed more than 100 miles of road in any of the past three years are as follows:

1878.		1877.		1876.	
Minnesota.....	338	Ohio.....	269	Texas.....	388
Iowa.....	256	California.....	235	California.....	350
Missouri.....	209	Minnesota.....	204	Ohio.....	270
Colorado.....	183	Texas.....	169	Colorado.....	155
Pennsylvania.....	188	Iowa.....	160	Kentucky.....	138
Kansas.....	169	New York.....	152	Wisconsin.....	124
New York.....	130	Colorado.....	124	Missouri.....	109
Idaho.....	119	Pennsylvania.....	120		
Texas.....	110				
Michigan.....	110				

The new roads this year, as in the year before, are chiefly for local traffic. Indeed, a very large number of them have connections only at one end, and so cannot serve to carry traffic from one road or system of roads to another. Out of 144 new lines no less than 52 are built as branches of old roads, not including extensions of main lines. Even this does not indicate the full extent to which the railroad construction of the country is determined by the old railroad companies. Of the 2,688 miles only about 600 were built by companies which had no road before 1878—excluding, of course, companies organized for the purpose of building roads for old companies and acting under the direction of the latter. This is an unusual proportion, and it is an indication that the new roads satisfy a demand and will have traffic to support them. In these times railroad companies which have had experience do not readily take up a new enterprise; they have the means of judging of the traffic of districts adjacent to their lines, and are very unlikely to invest capital in a line which is not likely to earn interest on the investment at an early day. Nine-tenths of the new road in Iowa and all of that in Minnesota consists of such branches and extensions, constructed by or at the instance of companies which have other lines in those states to which the new roads will be tributary.

Among the lines built for through traffic, or for connecting old roads together—of which there has been a considerable number, though most of them are short—may be mentioned the Boston, Hoosac Tunnel & Western, which will give the Erie a favorable connection with Boston and New England; three connections with the New York Central from roads to the south of it, two of which are coal roads; the Pittsburgh & Lake Erie, which will enable the Atlantic & Great Western and the Lake Shore & Michigan Southern to compete for traffic between Pittsburgh and the West; the St. Vincent Extension of the St. Paul & Pacific, with the Canadian extension of it to the capital of Manitoba at Fort Garry, which for the first time fairly opens this great undeveloped empire to the world; the Kansas City Extension of the Chicago & Alton, which will give this company a road of its own instead of leasing the St. Louis, Kansas City & Northern for 160 miles, as it has done hitherto; the Atchison, Topeka & Santa Fe and the Southern Pacific, which are rapidly coming together to form a new railroad route to the Pacific; and the Utah & Northern, which is on its way to Montana and likely soon to give that territory its first convenient outlet.

The average length of the new roads was about the same as in the previous years, as will appear in the following:

Year.	No. of lines.	Total built.	Average length.
1872.....	210	7,340 miles.	35.0 miles.
1873.....	137	3,883 "	28.3 "
1874.....	105	2,025 "	19.3 "
1875.....	94	1,561 "	16.6 "
1876.....	107	2,460 "	23.0 "
1877.....	122	2,281 "	18.7 "
1878.....	144	2,688 "	18.7 "

Again a very large proportion of the new road is of narrow gauge, nearly the same as last year—33 per cent. against 33.9. The number of miles this year is 871, against 776 last year.

In this and all the other comparisons it must be remembered that the figures for 1878 are not complete,

while those of previous years are so substantially. Last year when our record was made up we had 82 miles less than the total for that year now reported, and making up this record so much earlier, it is probable that we shall have at least as much to add to the total here reported for 1878.

The prospect for railroad extension in 1879 seems good. We find between 50 and 60 of the 140 lines built in 1878 which it is intended to extend further in 1879, and among them are such important lines as the Atchison, Topeka & Santa Fe, the Southern Pacific and the Utah & Northern; and of course new lines will be begun. Much will depend on the character of the next harvest. Should that be favorable, considerable activity in the construction of branches may be expected, especially in Minnesota, Iowa, Kansas and Nebraska. On the other hand, should it be unfavorable, immigration will probably be checked, and the construction of many new roads be put off to a more favorable season.

PATENTS.

Scribner's Monthly for last November contains an article on "Our Patent System, and What We Owe to it," which has fairly launched the subject into the realms of popular discussion. The scope of the article might be indicated by interrogative sub-titles somewhat as follows: Patents, why are they granted? What is their use? and what is due to Patentees?

"Patents for invention," the writer says, "are based on the theory of intellectual property, that is to say, the right of men to own and control the creations of their minds, not less than the work of their hands." Now it must be confessed that this theory becomes, when we analyze it, very vague, shadowy and elusive. The fact is, the patent system *does not* give inventors "the right to own and control the creations of their minds," excepting under certain conditions which are rather destructive to the theory of intellectual property. Thus, the patent law provides that an invention must be "new and useful." Now supposing that an inventor devises something which turns out not to be new—as happens so many hundreds of times—on "the theory of intellectual property" why does the patent system give the first inventor "the control of the creations of his mind" and not the second or third? There may be a verbal quibble, of course, by saying that the second creation is not an invention, or that in the nature of the case the first discovery is the only invention. Those who have had opportunities of observation and experience in such matters, however, know that there may be two or more entirely original and simultaneous discoveries or inventions, made quite independent of each other, at times, in remote parts of the world. The patent law protects the first discoverer and not any subsequent ones. This is not the principle on which other property is based. It is not the person who raises the first bushel of wheat or bale of cotton, or takes out the first ton of coal, or catches the first fish, or who paints the first picture, or writes the first book that is permitted to own or control it. Every bushel of wheat, and the other products of man's industry and labor, is recognized as property, and not the first only, as in the case of property in patents.

It has often been assumed that the laws of copyright and patents were analogous, and yet it is not the author who writes the first book on any subject, or who first propounds certain theories or ideas, who is protected by a copyright. A dozen books may be written or pictures painted, all presenting the same subject and all be the property of the authors and be protected by a copyright.

Herbert Spencer, who is one of the strongest advocates of the right of property in inventions says: "It is manifest that the moral law permits a man who has by his intellectual labor obtained such new knowledge, to keep it for his own exclusive use, or claim it as his private property." But, after advocating this theory with much force, he adds: "In consequence of the probability, or perhaps we may say certainty, that the causes leading to the evolution of a new idea in our mind will eventually produce a like result in some other mind, the claim above set forth must not be admitted without limitation. Many have remarked the tendency that exists for an important invention or discovery to be made by independent investigators nearly at the same time. There is nothing really mysterious in this. A certain state of knowledge, a recent advancement in science, the occurrence of some new social want—these form the conditions under which minds of similar characters are stimulated to like trains of thought, ending as they are prone to do in the same result. Such being the fact, there arises a qualification to the right of property in ideas which it seems difficult and even impossible to specify

definitely. The laws of patent and copyright express this qualification by confirming the inventor's or author's privilege within a certain term of years. But in what way the length of that term may be found with correctness there is no saying." He leaves the question still unanswered, why he who by intellectual labor first obtains new knowledge or makes an invention or discovery should be protected in the use of that knowledge, while he who does the same thing afterward is deprived of the use of his labor.

There is in fact a radical difference between the right to property which is the product of either manual or intellectual labor and that right which the patent law gives in virtue of the first discovery. In the one case the property is the result or the equivalent of the labor performed; in the other a patent is a *premium* which the state offers for the firstness—so to speak—of discovery or invention. It has the same characters as the premiums offered at agricultural shows or paid on a railroad to the locomotive runner who has run with the least amount of fuel for a month or a year. A patent is a premium which the state offers to stimulate invention, and the wisdom or the unwisdom of the system rests alone on the ground of expediency. The framers of our constitution seemed so to regard it, as the clause was inserted giving power to Congress "to promote the progress of science and useful arts; by securing for limited time, to authors and inventors, the exclusive right to their respective writings and discoveries."

If the principle is once distinctly and fully recognized, that an inventor's rights, in theory and under the law, are solely due to the firstness, the newness or priority of his invention over all others, then perhaps it may prevent some confusion of ideas. No matter how much ingenuity and intellectual labor a person may expend on an invention, if any one has done the same thing before him, he has no right to the exclusive results of his labor, and if patented by some one else he has no right at all to the use of what he has devised.

Considering how conflicting are the various interests involved in the patent system, it is perhaps not remarkable that very diverse views should be held regarding its usefulness. That it has a very stimulating effect there can be no doubt, but whether the stimulation is always wholesome to the body politic or to its individual members is a question about which much could be said on both sides. As a recent writer on this subject says: "By offering a prize of this description, one for which all men have a right to contend, a state enlists the intellect of humanity in its work of securing the utmost good to its life." In a certain sense this is, of course, true, but it is also unfortunately a fact that the patent system enlists the intellect of a large number of fools and knaves, as every railroad manager knows to his sorrow. In the first class the stimulant of the patent system has an effect analogous to that of gambling, and produces an unhealthy state of mind bordering very closely on lunacy. The number of this class of people in the community is very large, and to them the patent system is a great evil. Nevertheless, there can be no doubt that the monopoly which the patent laws give to first inventors has induced many able men to devote to their ideas the time and money required to put them into practical working order, or, to quote again from Herbert Spencer: "Just in so far as the benefits likely to accrue to the inventor are precarious will he be deterred from carrying out his plans. 'If,' thinks he to himself, 'others are to enjoy the fruits of these wearisome studies and these numberless experiments, why should I contrive them? If, in addition to all the possibilities of failure in the scheme itself, all the time, trouble and expense of my investigations, all the chances of destruction to my claim by disclosure of the plan, all the heavy costs attendant upon obtaining legal protection, I am liable to be deprived of my right by any scoundrel who may infringe it in the expectation that I shall not have money or madness enough to institute a chancery suit against him, I had better abandon the project at once.'" There can be no doubt that a great part of our progress in mechanical art has been largely due to the stimulus given by our patent system, and that it would be great folly so to modify it as to make it difficult or impossible for the first inventor to acquire the privileges and rights which the law now gives him, or of reaping the reward of his labor and ingenuity.

The educational influence of the patent system is very great. It has trained almost a special class of men whose time is largely devoted to investigation and discovery. Take away the premium, which the law now offers to the man who comes in first in the race of discovery, and those men would probably devote themselves to other work which would offer some reward. Certainly railroad companies, which are so largely dependent for

their success upon the results of invention, would be very short-sighted to take away all or any hope of reward from inventors. It is to their interest to do all that is possible to stimulate invention. Any, even a small, percentage of reduction in the expenditure for operating railroads by the discovery of improved processes, materials or machines would amount to an immense aggregate each year. Every facility and stimulus should be offered to men who are competent to do this kind of work.

And yet there is another side to this question, which has been presented by Mr. Raymond, the Secretary of the Western Railroad Association, in the January number of *Scribner's Monthly*. The writer, in the November number, says: "Opposition to the patent system rarely comes from inventors and manufacturers. That ungrateful work is almost entirely monopolized by the railway companies, or, rather, a few of them. Forgetting the important circumstance that it is to the inventors that they owe their daily successes, not less than their original existence, they foolishly think that they can succeed indefinitely without them; at any rate they adopt the course best calculated to drive invention into other channels; and not satisfied with boldly invading inventors' rights, they have the assurance to appeal to Congress for an amendment of the patent law, which shall put inventors completely under their thumbs. Foremost in this effort has been the Western Railway Association, the temper of which is fairly illustrated by the cool avowal of one of its prominent members, that 'whenever our attention is called to a patent of value we use it, and in a few cases we are made to pay by plucky inventors; but in the aggregate we pay much less than if we took licenses first.'"

"This statement," Mr. Raymond in his article says, "is utterly, unqualifiedly and absolutely false in every particular." We cannot follow him in the discussion of the subject, which our readers would do well to read in full where it originally appeared. In considering the question whether a railroad company should use a patent, the question of its usefulness must of course be first considered. With this the Western Railroad Association at present does not concern itself, excepting to a very limited extent. But, as has been shown, the "controlling element" in the right or privilege granted to a patentee is its *newness* or *firstness*. If the inventor is not the first inventor, the law will give him no rights or privileges. It is largely to the determination of this question that the Western Railroad Association devotes itself. It often happens that conflicting claims for the priority of invention arise. These of course must be decided by or for a railroad company before the rights of an inventor can be recognized. Every railroad manager of experience knows how subject railroad companies are to what Mr. Raymond calls the "black-mailing of patent sharks," who present frivolous and invalid claims. The attempt to bribe and corrupt subordinate officers is usually one of the first efforts of such sharpers, and a company sometimes finds that the loyalty of its employes is thus poisoned at the fountain head. It is not to be wondered at that railroad companies have combined to investigate the validity of claims made against them, and in the language of Mr. Raymond: "The Western Railroad Association was reorganized in 1874, prior to which time its members had paid millions of dollars for claims which had no real foundation, either in law or in fact, and had been in the habit of paying reasonable royalties for improvements without any reference as to whether they infringed other patents."

It is of course true that a combination of powerful corporations could be made a means of great oppression to inventors, especially to those with little or no money or capacity to fight their own battles. The same thing is true though of all strong organizations, and whether the Association will be oppressive or not must be determined entirely by its conduct in the past and in the future.

The amendments to the patent bill involve almost purely legal questions, of the significance of which a layman can hardly be a competent judge. That the rule for the recovery of damages now in force is often oppressive there seems to be no doubt. That a "reasonable limitation of time" within which a reissue may be had would be just will depend almost entirely on the interpretation put on the word "reasonable." "A provision for taking testimony *in perpetuum*" is undoubtedly needed, and that invalid patents should be annulled also seems reasonable. A fee at the end of say four years and another at the end of eight or nine years, in order to get rid of many patents whose lives are not worth preserving also seems to be a good provision, unless these fees are made so high as to be a serious obstacle in the way of poor inventors. The recording of licenses appears a simple precaution

which should be observed in any business transaction involving any considerable amount of money.

Whether the present bill contains any lurking provisions which would work hardship to inventors, as we have said, perhaps only an experienced lawyer can know; but that there is much legitimate and proper work for an association like the one referred to in determining the validity of patents, no one who has had any experience in the demands made upon railroad companies can have any doubt.

The New York Central's Steamer Line.

The New York papers during the past week have had a great deal to say about the establishment of a new line of steamers to run in connection with the New York Central Railroad to Liverpool and other European ports. Apparently the connection of the steamers with the railroad is not very definitely known, and on its face it is not easy to see why New York should be particularly benefited by the establishment of another line. There has been no lack of steamer room, that we have heard. Nothing is easier to get nowadays. The prospect of a cargo brings steamers to almost any quarter of the globe, and there have been so many tied up in English harbors that there seems to have been as great an "over production" of them as of so many other articles of late years. It is not said, and it is not probable, that the new line will carry freight at less than current rates, whatever they may be, or that they will carry less for the New York Central than similar vessels can be got to carry for other companies or for individuals.

What is peculiar to the new line is, however, notable enough, and is likely to have a considerable effect. In the first place, the vessels of the new line are exclusively for carrying freight, and, we believe, will not sail exclusively to Liverpool or any other European port, but will carry to any port for which they can get a full cargo; and what is especially important, they will go to the railroad company's elevator to be loaded.

Heretofore the railroad company bringing grain to New York has been compelled to deliver it by lighter or floating elevator anywhere in the harbor. The ship would not come to it and it had to go to the ship. The cost of this harbor delivery is a material increase of the cost of transportation from Chicago to New York—often a very large proportion of the total receipt. And this is the only port where this costly handling is required. At Boston, Philadelphia and Baltimore the vessels load from the elevators and warehouses of the railroads, and this has been a very great advantage. The elimination of the expenses of transfer is one of the directions in which most progress has been made in reducing the cost of transportation, but there has been so powerful a resistance to it in New York, due probably to old customs, established methods of doing business, and a system adapted chiefly to canal receipts, that little progress has been made in it there.

It is desirable that all great staples on reaching a leading distributing market should remain at the terminus of the route bringing them until they are reshipped. Any intermediate handling is likely to be pure waste of work. Grain and provisions may just as well be taken, by the vessel which carries them to Europe, from Jersey City or the foot of Sixty-first street as from a merchant's warehouse or a Brooklyn elevator.

But another of the "modern improvements" in the methods of doing business is the elimination of merchants as well as of transfers; more and more, as the connections of transportation lines in all parts of the world become closer and more trustworthy, the merchandise passes directly from the producer to the consumer. Instead of a sale of grain by the farmer to the merchant at the Western country station, a sale by the country merchant to the Chicago merchant, by him to the Buffalo merchant, by him to the New York merchant, and by him finally to the Liverpool or London merchant, the Liverpool or London merchant now to a great extent buys in Chicago or other great market nearest the producer. Having done this, he only wants to get his purchase carried to him in the cheapest and directest way. Its transfer at the Atlantic port may then be managed by the railroad company without regard to local custom, if it can induce the vessels to suit its convenience. And if it can, and the shipments of freight through from the West to Europe have the advantage of the economical transfer, the rest of the business, at least of the export business, is likely to take the same course before long, else the through shipments will monopolize the foreign market.

It is to be hoped that this new step will finally compel the general adoption of rational methods in the conduct of business requiring transfers of freight in New York. Neither merchants nor carriers may gain greatly by the economies thus effected: in the long run they will probably have to be satisfied with about the same profits as are obtained at other ports; but if they do not, some one else will—the producer or consumer, or both; and if New York has not lost much recently even in export business, it has sometimes seemed that it deserved to.

Report of the Iowa Railroad Commission.

The first annual report of the Iowa Railroad Commissioners has been prepared and is now in the hands of the printers. For the following summary and extracts we are indebted to the Davenport Gazette:

"The Board now consists of James W. McDill, Peter A. Dey and M. C. Woodruff, the latter having been appointed to the vacancy occasioned by the resignation of ex-Governor C. C. Carpenter when accepting the nomination to Congress, in August, 1878. The Board was regularly organized on

April 4, 1878, and J. S. Cameron chosen its Secretary. The cases submitted to the consideration and decision of the Board have been the following: The complaint of the Keokuk & Des Moines against the Des Moines & Ft. Dodge for discriminating in favor of the Chicago, Rock Island & Pacific in various items relating to the use and transfer of cars, etc., decided in favor of the complainant, and the difference between the Consolidated Coal Company, the Excelsior Coal Company, the Hickory Grove Coal Company, concerning the Receiver of the Central Railroad of Iowa in the matter of a contract for carrying coal; decided by the Board that said contract was against public policy. Two other complaints were made. In one case the required evidence was not presented and in the other the charges were withdrawn. The decisions made have been complied with.

"The Board, through some one of its members, inspected every line of road in the state, and report thereon, as required by law. As to the inspection of bridges also required, the Board have not complied with the law, saying:

"As there are about 16,000 such structures in the state, the Board find it utterly impossible to do this, and recommend that the Legislature revise its legislation and enact that the various roadmasters be required to report to the Commissioners quarterly the state of the bridges under their charge; that the Commissioners notify the railway companies of the bridges and the companies be required to take measures for repairs. Many of the bridges, however, have been examined, and the imperfections reported to the owning companies, and have been promptly attended to.

"One of the members, as directed by the Board, has prepared a compilation of all the state laws in relation to railroads, and the same is made a part of the report. Complaint is made of the incompleteness of the reports furnished to the commissioners by the railroad companies, as required by law, and these results are given:

"The aggregate debt of the roads in Iowa is estimated at \$84,744,418.52. Of this, \$3,401,651.19 is floating, and \$81,342,767.33 bonded, or an average of \$15,574.80 per mile. The stock and debt amount to \$153,601,784.47, or \$36,949.80 per mile. The Des Moines & Ft. Dodge represents in capital and indebtedness \$70,849 per mile, the highest; the Iowa Midland represents \$21,786.55, the lowest of the standard-gauge roads. If the Iowa roads are not remunerative, the Board thinks one reason for it is plainly assigned: They represent largely more in capital than they would had they been economically built. The narrow gauges are reported as having capital and debt per mile: Burlington & Northwestern, \$5,779; Des Moines & Minneapolis, \$8,600; Crooked Creek, \$8,925; Waukon & Mississippi, \$6,748—showing a much less expenditure per mile than the standard gauge. These narrow gauges are, however, cheaply built and but poorly furnished.

"The entire earnings of Iowa roads are: Passengers, mail and express, \$5,178,624.02; freight and miscellaneous, \$15,588,875.05—a total of \$20,714,496.07. The earnings from passenger trains per mile run vary from 1.62 on the Chicago, Milwaukee & St. Paul, 1.35 on the Chicago & Northwestern, 1.29 on the Chicago, Rock Island & Pacific, to 0.77 on the Sioux City & Pacific, and 0.56 on the Missouri, Iowa & Nebraska. The earnings from freight trains per mile run vary from 3.54 on the Sioux City & Pacific to 1.09 on the Iowa Midland, the Chicago, Milwaukee & St. Paul, 1.77; the Chicago & Northwestern, 1.77; the Chicago, Rock Island & Pacific, 1.32; the Burlington, Cedar Rapids & Northern, 2.43; the Central of Iowa, 1.92, and the Keokuk & Des Moines, 1.78.

"The total operating expenses of the roads in the state are \$12,565,950.33, varying from 1.44 per train mile run on the Sioux City & Pacific, to 0.75 on the Chicago, Rock Island & Pacific. The difference between the operating expenses and the earnings is \$8,148,545.34. The expenses of six roads exceed their gross earnings. The Iowa Midland costs to operate above its earnings 34 per cent.; Missouri, Iowa & Nebraska, 3 per cent.; St. Louis, Ottumwa & Cedar Rapids, 30 per cent.; Sabula, Ackley & Dakota, 25 per cent.; Burlington & Northwestern, 5 per cent., and the Crooked Creek, 22 per cent. Fifteen roads show an excess, after deducting operating expenses, interest, taxes and rental. The total excess is \$4,923,687.81; the other roads a deficit of \$508,636.40; net income, \$4,415,051.41, add to which the rent of leased roads, above interest, etc., \$1,150,172.40, making \$5,565,223.81, a net earning per mile on the entire lines in the state of \$1,445.98. The total amount of taxes paid is \$594,912.65; 2,953.88 miles of road are owned by the companies running them; 1,903.27 are leased and run mainly by foreign corporations. The Chicago & Northwestern owns but 8½ miles of road in the state, but operates 425. The Illinois Central owns no road, but operates 463 miles. There are 450.61 miles of side track in the state.

"The total number of miles of steel rails laid on roads, 905.54, about 80 per cent., being on the Chicago & Northwestern (22 miles), the Chicago, Rock Island & Pacific (298), and the Burlington, Cedar Rapids & Northern (79.59). The Board says great care has been exercised by different roads in improving the road-bed and track.

"The total number of wooden bridges is 1,219, the length being 139,552 feet; of iron, 54; in length, 13,942 feet; of trestle and pile bridges, 5,386; in length, 527,904; of stone bridges and culverts, 333, the length, 5,596.

"The total number employed directly is 13,513, while indirectly, in working quarries, building masonry, getting timber and ties, a large number additional.

"The total number of miles of fence built is 3,890, the number required, 2,738. The Board recommends that those roads operating without fence should be run at a lower rate of speed.

"Nine hundred and seventy-six locomotives are used, four-fifths of them weighing over forty tons. The total number of passengers carried in the year was 7,511,770; carried one mile, 280,274,225; tons freight carried, 6,804,338; carried one mile, 1,514,088,462. Of this tonnage, 31 per cent. was grain, 5 was flour, 1 was provisions, 8 was animals, 18 was lumber and forest products, 1 was coal, 1 was salt, 2 was iron and steel, 2 was stone and brick, 1 was manufactured articles, and 20 was merchandise.

"The average rate of transportation of passengers is 3 cents per mile."

Then these additional particulars are given: "During the year, 17 passengers were killed from causes beyond their control. Three from their own carelessness. Six employees from causes beyond their control, twenty-three from their own carelessness; of others there were three killed at stations and highway crossings, twenty-two walking on track and trespassing, and six stealing rides. Total number killed, 80; injured, 223. The Altona disaster added materially to the list of killed and injured.

"The Iowa roads have received from land grants by Congress to aid in their construction, 4,069,942.56 acres. The Des Moines Valley Road received 493,846.22 acres. Neither the Keokuk & Des Moines company nor the Des Moines & Fort Dodge are able to furnish any information with regard to the disposal of the lands. The Burlington & Missouri River received from grant 360,073.96 acres, of which 38,366.77 remain unsold. The Chicago, Rock Island & Pacific received 550,193.51 acres; 299,425.56 unsold. The C., B. & M. R. R. received 946,593.43 acres; all sold. The

Burlington & Missouri River realized from 321,106 acres sold, \$2,175,317; the Chicago, Rock Island & Pacific from 251,764.65 sold, \$1,907,838.

"The 'Iowa pool' question is discussed at length, and the conclusion reached that said pool has been an advantage rather than otherwise, since if the roads comprising it were obliged to scramble and cut rates for the through freight from Omaha to Chicago they would be very likely to raise local rates to make up for losses."

The Cleveland Viaduct.

The great viaduct over the Cuyahoga River and the adjacent low grounds, connecting two parts of the city of Cleveland, which has been under construction for four years past, is now finally completed and was publicly opened last week with a great celebration. The structure is thus described by the Cleveland Herald:

"The structure, as it stands, is built partly of stone and partly of iron, and its entire length, from its starting point at the intersection of Superior and Water streets, on the east side of the river, to its terminus at the intersection of Pearl and Detroit streets on the west side, is 3,211 feet, or nearly two-thirds of a mile. No better location could have been selected for its eastern terminus, since, while being on nearly a straight line with the southern side of Superior street, thus forming practically a continuation of that street, the latter is so wide at that point that ample space is left to the north of the structure for the approach to Superior street hill, leading down to Union, River and Merwin streets and to the river. Beginning at this eastern point at the crown of the hill the first 150 feet is heavy stone retaining walls, filled in with earth, and paved. Then comes the iron work: first three 50-foot spans of 50-inch iron plate girders, succeeded by two 145-foot spans and one 160-foot span of what is known as a double intersection Pratt truss. The height of the truss in the 145-foot span is 18 feet 6 inches from centre to centre of chords, and that of the 160-foot span 20 feet. The western end of the 160-foot span rests on the first river pier, of heavy masonry, rising out of the river about 65 feet from the east bank. The 332 feet between this pier and the first arch of the mason work on the west side, about 150 feet from the west bank of the river, is spanned by a swing or draw-bridge constructed on the same plan as the last three fixed spans on the east side of the river. The height of the truss in the draw is 30 feet in the centre and 20 feet at the ends. The total weight of iron in the fixed spans and draw is 1,440 tons. The weight of the draw and turn table alone is 685 tons—95 tons of iron in the turn table, 440 tons in the draw, and 150 tons of planking. The large pivot pier (of course of stone) on which the draw turns, stands just at the edge of the west bank, partly in the water, and there is left between the two piers about 130 feet of clear water-way. The draw, which although not the longest, is, perhaps, the heaviest in the world, is turned by steam, the boiler and engine being on top of the pivot pier and inclosed in an engine room built for the purpose. The great pile of masonry which constitutes the west side part of the viaduct, 1,379 feet in length, consists of ten arches—eight of 83 feet span and two of 97½ feet span—and retaining walls filled in with earth and paved. The retaining walls are between the two large arches. The remainder of the way up to Pearl street is partly an embankment and partly an excavation. In all, 80,500 perches of stone were used in the masonry of the viaduct. The river piers and the first nine arches on the west side have pile foundations, in the construction of which 277,000 lineal feet (between 55 and 56 miles) of piling was used. The approach to the draw on each side is to be guarded by safety gates, which will be closed when the draw is opened.

"The floor of the draw is 68 feet above the ordinary stage of water in the river, while the elevation at the eastern end of the Viaduct at Water street is 73 feet, and at the western end at Pearl street, 91½ feet, thus giving a light down grade from each end toward the draw. From Water street the grade descends toward the draw at the rate of 8 inches per 100 feet; the entire length of the draw-span is level, and from the draw to the western end of the masonry, a distance of 1,379 feet, the grade rises at the rate of 6 inches per 100 feet, after which an up grade of 2 feet 10 inches per 100 feet is maintained to Pearl street. Except on the draw the structure has a uniform width, from out to out, of 64 feet—42 feet of roadway, and an 11-foot sidewalk on each side. The width of the draw is 46 feet—a 32-foot roadway and two 7-foot sidewalks. The roadway on the west side and on the retaining wall on the east side of the river is of blocks of the best quality of Medina (New York) sandstone, filled in with Trinidad asphalt and coal tar, of which latter articles nearly 3,000 barrels were used, making it perfectly watertight. The sidewalks on these portions are of Cleveland blue sawed-stone. The roadway on the fixed spans is Nicholson, filled in with Abbot's cement, with a plank bottom. The draw is covered with a double planked floor. A double track for street cars is laid in the roadway, to be let to street car companies desiring to use it. The roadway has a crown of 6 inches, and as a whole the top of the Viaduct is constructed and looks much like an ordinary street, the sidewalks being raised about six inches above the roadway, from which they are separated by curbing.

"A tasteful iron railing, 3½ feet high, guards the entire length of each side, except for the first few hundred feet of the southern line on the east side of the river, against and above which rise business blocks, fronting on the Viaduct in the same manner as if it were a street, and serving to heighten the substantial appearance of the structure. Among these buildings is the new Atwater Block, the old one having been condemned and torn down to make way for the bridge, and its beautiful front is one of the most conspicuous and striking objects seen by the traveler passing along Superior street toward the Viaduct. At the extreme eastern end of the north side of the Viaduct, and, therefore, fronting the centre of Superior street, is a bright red gas lamp, which serves as a beacon light at night, the traveler going to the left of it or to the right of it, as he desires to cross the bridge or to go down Superior street hill. The remainder of the way across is lighted by ordinary gas lamps, placed at intervals of from 75 to 100 feet. Besides the regular approaches at the eastern and western termini, the bridge will be reached by three iron stairways—one of these near Merwin street, on the east side of the river; one at Pier No. 8, near West River street; and the other at Pier No. 15, near Center street."

The contractors for the work were: Masonry on west side, E. W. Ensign; masonry on east side, Sherman & Flagler; iron bridge work, Claffen & Sheldon; steam-engine and machinery for draw, W. H. Thompson; paving and curbing, Albion-Medina Stone Co.; sidewalks, Maxwell, McBride & Malone; sewer, John Mahon, Jr.; iron railing, Lauderbach & Co.; iron stairs, Woodhull & O'Gorman and Claffen & Sheldon. All are Cleveland people except E. W. Ensign, who is from Buffalo, and Lauderbach & Co., from Pittsburgh.

The total cost, including bills to be paid, is \$3,151,468.88. The work has been under charge of the City Civil Engineer, B. F. Morse, and his first assistant, Mr. S. H. Miller, the latter of whom acted as Superintending Engineer of the work.

Railroad Construction in the United States in 1878.

The following is a tabular statement of the new railroad lines in the United States on which track was laid in 1878, according to the information received during the year to this date:

	MILES.
Manchester & Keene (Hancock w. to Keene).....	17
Peterboro & Hillsboro (Peterboro n. to Hillsboro).....	18
Total in New Hampshire.....	35
MASSACHUSETTS.	
Holyoke & Westfield (around and in Holyoke).....	4
Spencer (Spencer station n. to Spencer).....	2
Total in Massachusetts.....	6
NEW YORK.	
Boston, Hoosac Tunnel & Western (Mechanicsville e. to Eagle Bridge).....	21
Brooklyn, Flatbush & Coney Island (Brooklyn s. to Brighton Beach).....	8
Cazenovia, Canastota & De Ruyter (Cazenovia s. to Sheed's Corners).....	10
Dannemora (3-ft. gauge, Plattsburg w. to Clinton Prison).....	17
Geneva & Lyons (Geneva n. to Lyons).....	15
Kings County Central (3-ft. gauge, Flatbush e. to Manhattan Beach Junction).....	3 3/4
Lockport & Buffalo (Tonawanda n. e. toward Lockport).....	6
Metropolitan Elevated (Morris st. to 59th st., New York).....	5 1/4
New York Elevated (South Ferry to Harle n (East Side) (60th st. to 80th st., West Side) ...)	8 1/4
New York & Manhattan Beach (3 ft.)—	1
Greenpoint to East New York.....	6
Coney Island Beach.....	2
Rochester & State Line (filling gap).....	5
Springville & Sardinia (Sardinia Junction w. to Springville, 3 ft. gauge).....	11
Utica & Black River (Morristown n. e. to Ogdensburg).....	10 1/2
Total in New York.....	129 1/4
NEW JERSEY.	
Central of New Jersey (Long Branch to Monmouth Park).....	1
New York & Greenwood Lake (connection with Erie).....	1 1/2
New Jersey Southern (extension to West End, Long Branch).....	1 1/2
Total in New Jersey.....	3
PENNSYLVANIA.	
Foxburg, St. Petersburg & Clarion (Turkey City e. to Jefferson City, 3 ft. gauge).....	5
Kendall & Eldred (in Bradford oil district, gauge 3 ft.).....	15
Lehigh & Lackawanna (Chapman's n. to Wind Gap).....	10
Lehigh & Susquehanna, Drifton Branch (Junction w. to Drifton).....	11
Lehigh Valley, Lost Creek Branch (Lost Creek to Girardville and Ashland).....	5
Mont Alto (extended toward Waynesboro).....	6
Olean, Bradford & Warren (filling gap, 3-ft. gauge).....	4 1/2
Pennsylvania—Port Ferry Connection.....	1
Philadelphia, Newtown & New York (Fox Chase n. e. to Newtown).....	15
Pittsburgh & Lake Erie (Pittsburgh n. w. to Ohio line).....	60
Pittsburgh, New Castle & Lake Erie (Etna n. w. to Harmony, 3-ft. gauge).....	30
Pittsburgh Southern (3-ft. gauge)—	
Extension to Erieville.....	4
Branch to Washington.....	10
Castle Shannon to Little Saw Mill Run R. R.	4
Salisbury (Extension s. w. to Salisbury).....	3
South Mountain (Jonestown e. to Frederickburg).....	4
Waynesboro & Washington (Extension through Washington, 3-ft. gauge).....	1
Total in Pennsylvania.....	188 1/2
DELAWARE.	
Junction & Breakwater (Lewes s. e. to Rehoboth Beach).....	6
Total in Delaware.....	6
MARYLAND.	
Baltimore & Hanover (Black Rock s. to Cramer's).....	5 1/2
Total in Maryland.....	5 1/2
VIRGINIA.	
Altoona Coal & Iron Co. (Martin's to Altoona Coal Mines, 3-ft. gauge).....	8 1/2
Pittsylvania (Ward's Mills w. to Crider's Mills, 3-ft. gauge).....	8
Total in Virginia.....	16 1/2
NORTH CAROLINA.	
Milton & Sutherland's (Va. line s. e. to Milton, 3-ft. gauge).....	4
Spartanburg & Asheville (S. C. line n. w. to Flat Rock).....	4
Western North Carolina (Henry w. to Swannanoa Tunnel).....	8
Total in North Carolina.....	16
SOUTH CAROLINA.	
Cheraw & Chester (extension east to Fishing Creek, 3-ft gauge).....	7 1/2
Spartanburg & Asheville (n. w. to S. C. line, 5-ft. gauge).....	9
Total in South Carolina.....	16 1/2
GEORGIA.	
Elberton Air Line (Toccoa City s. to Elberton, 3-ft. gauge).....	45
Marietta & North Georgia (Marietta northward, 3-ft. gauge).....	26
Ocmulgee & Horae Creek.....	7
Total in Georgia.....	62
ALABAMA.	
Alabama Central (Troy w. to Mississippi line, 5-ft. gauge).....	7
Mobile & Spring Hill.....	8
South & North Alabama (Elmore e. to Wetumpka, 5-ft. gauge).....	7
Total in Alabama.....	22
MISSISSIPPI.	
Alabama Central (Alabama line w. to Lauderdale, 5-ft. gauge).....	8
Greenville, Columbus & Birmingham (Greenville e. to Deer Creek, 3-ft. gauge).....	9 1/2
Natchez, Jackson & Columbus (Fayette n. e. to Meriwether, 3 ft. 6 in. gauge).....	8 1/2
Total in Mississippi.....	26
TEXAS.	
Corpus Christi, San Diego & Rio Grande (Banquette w. to Collins, 3-ft. gauge).....	15
Denison & Southwestern (s. e. to Whiteright).....	17
East Line & Red River (Daingerfield n. w. to Winsboro, 5-ft. gauge).....	34 1/2
Georgetown & North Rock n. w. to Georgetown).....	26
Gulf, Colorado & Santa Fe (Arcola n. w. to Richmond).....	18
Longview & Sabine Valley (3 ft).....	6
Neches.....	8
Total in Texas.....	118 1/2

ARKANSAS.	
Searcy (Kenett w. to Searcy).....	7
Total in Arkansas.....	7
TENNESSEE.	
Holly Springs, Brownsville & Southern (Brownsville n., gauge 3 ft.).....	10
Total in Tennessee.....	10
KENTUCKY.	
Covington, Flemingsburg & Pound Gap (Flemingsburg s. e. to Hillsboro, 3-ft. gauge).....	12
Louisville & Nashville—	
Cumberland & Ohio Southern Division (Lebanon s., gauge 5 ft.).....	5
Pine Hill (Pine Hill w. to Tunnel, 3 ft. gauge).....	3
Total in Kentucky.....	20
WEST VIRGINIA.	
Pittsburgh, Wheeling & Kentucky (extension s. into Wheeling).....	3½
Shenandoah Valley (Duffield's s. to Clark Co. line).....	13
Total in West Virginia.....	10
OHIO.	
Cincinnati & Eastern (3 ft. gauge)—	
Extension westward.....	5
Richmond Branch (junction s. e. to Tobacco).....	7
Cincinnati & Portsmouth (extension e. to Amalia, 3-ft. gauge).....	9
Indianapolis, Cincinnati & Lafayette (Great Bend w. to Ind. line).....	3
Lake Erie & Louisville (Branch, St. Mary w. to Celina).....	11
Pittsburgh & Lake Erie (Pennsylvania line w. to Youngstown).....	8
Springfield, Jackson & Pomeroy (Washington s. e. to Waverly, 3-ft. gauge).....	48
Toledo & Ann Arbor (Toledo n. to Michigan line, 3-ft. gauge).....	6
Total in Ohio.....	97
MICHIGAN.	
Chicago, Saginaw & Canada (Cedar Lake w. to Edmore Detroit & Bay City).....	5
Caro Branch (Vassar n. e. to Caro).....	13
East Saginaw Branch (Vassar n. w. to East Saginaw).....	17
Detroit, Lansing & Northern (Stanton n. to Blanchard).....	17½
Flint & Pere Marquette (Branch from Farwell north).....	3
Lake Huron & Southwestern (Tawas City s. w. to Au Gres River, 3-ft. gauge).....	13
Toledo & Ann Arbor (Ohio line n. by w. to Ann Arbor, 3 ft. gauge).....	40
Total in Michigan.....	110
INDIANA.	
Cincinnati, Rockport & Southwestern (Ferdinand n. to Jasper).....	13½
Delphos, Bluffton & Frankfort (Bluffton w. to Warren, 3-ft. gauge).....	14
Indianapolis, Decatur & Springfield (Montezuma e. to Guion).....	16
Indianapolis, Delphi & Chicago (Rensselaer s. e. to Monticello, 3-ft. gauge).....	55½
Indianapolis, Cincinnati & Lafayette (Lawrenceburg Cut-off, Guilford e. to O. line).....	5
Total in Indiana.....	74
ILLINOIS.	
Belleville & El Dorado (extension w. to Benton).....	16
Danville, Olney & Ohio River (Kansas, Ill., s. w. to Westfield, 3-ft. gauge).....	10
Grayville & Mattoon (extension n. w. to Mattoon).....	16
Havana, Rantoul & Eastern (Fisher w. by s. to Leroy, 3-ft. gauge).....	23
St. Louis & St. Louis (Extension in East St. Louis to bridge).....	1
Illinois Central—	
Chatsworth Branch (Otto s. w. to Chatsworth).....	37
Total in Illinois.....	103
WISCONSIN.	
Milwaukee, Lake Shore & Western (New London n. w. to Clintonville).....	15
River Falls (Hudson s. e. to River Falls).....	12½
Viroqua (Sparta s. to Melvin).....	13
North Wisconsin (Clayton n. to Granite Lake).....	20
Woodman & Lancaster (3 ft.).....	28½
Total in Wisconsin.....	86
MINNESOTA.	
Chicago & Northwest—	
Chatfield (Eyota s. to Chatfield).....	12½
Minnesota Valley (Sleepy Eye Lake n. w. to Redwood Falls).....	26
Plainview (junction 1 m. w. of Eyota n. to Plainview).....	15
Rochester & Northern Minnesota (junction 1½ m. w. of Rochester n. w. to Zumbrota).....	24½
Chicago, Milwaukee & St. Paul—	
Hastings & Dakota Division (Glencoe w. to Montevideo).....	82½
Minnesota Midland (Millville w. to Zumbrota, 3-ft. gauge).....	31
St. Paul & Pacific—	
First Division Branch (Melrose n. w. to Alexandria).....	33
St. Vincent Extension (Crookston n. w. to Manitoba line).....	63
Southern Minnesota Extension (Winnebago w. by s. to Jackson).....	45
Worthington & Sioux Falls (Beaver Falls w. to Dakota line).....	6
Total in Minnesota.....	338
IOWA.	
Chicago, Milwaukee & St. Paul—	
Iowa & Dakota Division (Algona w. to Pattersonville).....	98
Chicago, Burlington & Quincy—	
Branch, Creston n. w. to Fontanelle.....	22
Hastings s. w. to Sidney.....	26
Chariton n. toward Indianola.....	20
Chicago, Rock Island & Pacific—	
Branch, Atlantic n. to Audubon.....	26
Avoca n. to Harlan.....	14
Des Moines, Adel & Western (Waukee w. to Adel, 3-ft. gauge).....	7
Des Moines & Minneapolis (Story City n. to Lakin, 3-ft. gauge).....	8
Fort Dodge & Fort Ridgely (extended northward, 3-ft. gauge).....	4
Sioux City & Pembina (Portlandville n. to Beloit).....	36½
Total in Iowa.....	258
MISSOURI.	
Chicago & Alton (Mexico westward).....	132
Little River Valley & Arkansas (extension to Malden; 3-ft. gauge).....	10
Missouri & Western (Oronogo to Joplin).....	7
Quincy, Missouri & Pacific (Kirksville westward).....	10
St. Joseph & Des Moines (St. Joseph n. e. to Union, 3-ft. gauge).....	23
Springfield & Western Missouri (Springfield w. to Ash Grove).....	20
West End Narrow-Gauge (Normandy w. to Florissant; 3-ft. gauge).....	10
Total in Missouri.....	209
KANSAS.	
Central Branch Union Pacific—	
Main Line (Clyde w. to Beloit).....	44½
Branch (Concordia n. to Scandia).....	30
Kansas Pacific—	
Junction City & Fort Kearney (Clay Centre n. w. to Clyde).....	22

Solomon (Solomon n. w. to Minneapolis).....	23
Kansas City, Burlington & Santa Fe (Williamsburg s. e. to Burlington).....	29
Memphis, Kansas & Colorado (Parsons e. to Weir City; 3-ft. gauge).....	31
Total in Kansas.....	169½
NEBRASKA.	
Omaha & Republican Valley (David City w. to County Line).....	14
Burlington & Missouri River— Republican Valley (Hastings s. w. to Red Cloud).....	41
Total in Nebraska.....	55
DAKOTA.	
Worthington & Sioux Falls (Minn. line s. w. to Sioux Falls).....	15
Total in Dakota.....	15
COLORADO.	
Atchison, Topeka & Santa Fe— Pueblo & Arkansas Valley (La Junta s. w. to New Mexico line).....	95½
Colorado Central— Golden Cut-off (Golden to Ralston).....	8
Narrow-Gauge Division (Black Hawk n. w. to Cent- ral City, 3-ft. gauge).....	4½
Denver & Rio Grande— San Juan Branch (Garland w. to Alamosa, 3 ft. gauge).....	31
Denver, South Park & Pacific (Bear Creek s. w. to Bright's, 3-ft. gauge).....	51
Golden, Boulder & Caribou (Boulder s. e. to Marshall Coal Mines).....	5¾
Total in Colorado.....	183¼
ARIZONA.	
Southern Pacific (Fort Yuma r. to Adonde).....	30
Total in Arizona.....	30
IDAHO.	
Utah & Northern (Franklin n. to Blackfoot; 3-ft. gauge).....	120
Total in Idaho.....	120
CALIFORNIA.	
Central Pacific— Northern (Williams n. to Willows).....	28
San Pablo & Tulare (Antioch e. to Martinez).....	10
San Francisco & North Pacific (Petaluma s. to San Rafael).....	22
South Pacific Coast (Alma southward, 3-ft. gauge)... ..	2½
Total in California.....	71¾
OREGON.	
Willamette Valley (Dayton s. w. to Sheridan and branch to Dallas).....	36
Total in Oregon.....	36
WASHINGTON.	
Olympia (Tenino n. w. to Olympia, 3-ft. gauge).....	15
Total in Washington.....	15
Total in United States, 1878.....	2,688
" " " " 1879.....	2,281
" " " " 1879.....	2,400
" " " " 1875.....	1,501
" " " " 1874.....	2,025
" " " " 1873.....	3,883
" " " " 1872.....	7,340

The distribution of the new construction among the several states and territories and groups thereof for each of the past six years is given in the following tables :

Mileage of New Railroad Constructed in each State and Territory for Six Years

	1872.	1873.	1874.	1875.	1876.	1877.	1878.
Alabama.....	72	2	18	0	0	14	0
Alaska.....	134	0	0	0	0	0	0
Arizona.....	0	0	0	0	0	0	30
Arkansas.....	156	217	18	395	47	0	0
California.....	195	143	140	18	384	714	714
Colorado.....	105	123	23	1114	1544	1236	194
Connecticut.....	25	20	0	21	7	34	0
Dakota.....	210	0	804	0	0	0	15
Delaware.....	210	2	10	0	0	0	0
Florida.....	104	0	18	0	0	13	0
Georgia.....	46	122	0	4	42	0	02
Idaho.....	0	0	0	0	0	0	130
Illinois.....	6804	2744	231	204	154	154	0
Indiana.....	381	814	200	1004	734	24	74
Indian Ter.....	142	0	0	0	2	0	0
Iowa.....	412	0	4	814	004	1054	254
Kansas.....	45	33	40	0	0	0	0
Kentucky.....	143	654	314	0	134	284	20
Louisiana.....	3	0	0	0	0	2	0
Maine.....	694	0	574	10	30	0	0
Maryland.....	194	37	17	17	54	0	0
Massachusetts.....	37	1174	574	36	5	174	6
Michigan.....	571	193	48	30	40	56	1104
Minnesota.....	307	48	30	0	34	204	4
Mississippi.....	25	7	27	0	0	0	21
Missouri.....	314	234	31	27	104	36	200
Montana.....	0	0	0	0	0	0	0
Nebraska.....	212	11	0	22	62	60	55
Nevada.....	18	14	0	44	0	18	0
N. Hampshire.....	43	60	45	154	94	14	35
New Jersey.....	103	404	0	724	54	814	4
New Mexico.....	0	0	0	0	0	0	0
New York.....	424	124	124	2	0	194	104
North Carolina.....	60	15	84	13	43	57	16
Ohio.....	4564	172	172	20	276	200	97
Oregon.....	82	0	0	0	0	0	36
Pennsylvania.....	2314	134	134	130	104	1194	104
Rhode Island.....	0	23	14	0	0	0	0
South Carolina.....	84	84	0	15	17	484	104
Tennessee.....	15	114	0	0	74	214	10
Texas.....	391	284	75	314	3874	104	1184
Utah.....	0	87	59	27	0	0	0
Vermont.....	31	54	5	22	0	74	0
Virginia.....	494	36	74	0	10	104	104
Washington.....	2	5	0	0	0	15	15
West Virginia.....	76	364	0	0	0	204	104
Wisconsin.....	4564	324	102	23	124	62	84
Wyoming T.....	0	0	0	0	0	0	0

RECAPITULATION BY SECTIONS.

	1972	1973	1974	1975	1976	1977	1978
New Eng'd [a]	1,472	1,481	1,474	1,553	1,675	1,677	1,674
Middle States [b]	1,010	541	387	437	250	433	283
South Atlantic							
States [c]	544	293	144	32	114	92	111
Gov't States [d]	260	341	138	34	308	185	167
8'th Interior [e]	535	464	49	39	197	79	63
N. Interior [f]	210	452	464	100	383	319	273
Northwest [g]	1,080	1,109	500	357	530	678	1,265
Far West [h]							
terior [h]	180	224	129	302	154	118	227
Pacific States [i]	317	135	147	190	345	298	122
Total	2,340	3,883	3,025	1,561	2,400	2,281	2,628

a New England includes Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut.
b The Middle States include New York, New Jersey, Pennsylvania, Delaware, Maryland and the District of Columbia.
c The South Atlantic States include Virginia, North Carolina, South Carolina and Georgia.
d The Gulf States include Florida, Alabama, Mississippi, Louisiana and Texas.
e In the South Interior are included Indian Territory, Arkansas, Tennessee, Kentucky and West Virginia.
f The North Interior includes Ohio, Michigan and Indiana.
g The Northwest includes Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska and Dakota.
h The Far West Interior covers the district between Texas and the Northwest and the Pacific States.
i The Pacific States are California, Oregon and Washington Territory.

East and West Through Traffic Convention.

The following is the official report of the meeting of the Eastern and Western Executive Committees and of the other railroad officers interested in east-bound freights, held at the Grand Pacific Hotel, Chicago, beginning Dec. 18, 1878:

Pursuant to the call of the Chairman, the Western Executive Committee and the Trunk Line Executive Committee, met at 11 a. m., Dec. 18. Present:

MEMBERS OF THE TRUNK LINE COMMITTEE.

Mr. Rutter, Gen. Traffic Manager N. Y. C. & H. R. R.
Mr. Blanchard, Assistant to Prest. N. Y., L. E. & W. R. R.
Mr. Cassatt, Third Vice-President Penn. R. R.
Mr. King, Vice-President Balt. & Ohio R. R.
Mr. Bentley, Gen. Manager Cent. Vermont R. R.
Mr. Fink, Commissioner.

MEMBERS OF THE WESTERN COMMITTEE.

Mr. McCullough, V. P. & Gen. Manager Penn. Co. and P. C. & St. Louis R. R., represented by Messrs. Gray and Stewart.

Mr. Newell, Gen. Manager L. S. & M. S. R. R.
Mr. Ledyard, Gen. Manager M. C. R. R.
Mr. King, Receiver O. & M. and M. & C. R. R., and Vice-President Balt. & Ohio R. R.
Mr. Hopkins, Vice-Prest. and Gen. Manager Wabash Ry.
Mr. Devereux, Receiver A. & G. W. Ry., and Prest. C. C. & I. Ry., represented by M. Thomas.
Mr. Simpson, Gen. Manager Vandalia Line.
Mr. Seargeant, Gen. Traffic Manager Grand Trunk Ry.
Mr. Broughton, Gen. Manager Gt. Western Ry.
Mr. McMullin, Gen. Manager C. & A. R. R., represented by Mr. Smith.

There were also present:

Mr. Cochran, General Freight Agent A. & G. W. Ry.
Mr. Kingsbury, Asst. General Freight Agent P. C. & St. L. Ry.
Mr. McCabe, Division Freight Agent P. C. & St. L. Ry.
Mr. Perkins, Division Freight Agent P. C. & St. L. Ry.
Mr. Wright, Receiver L. E. & W. Ry.
Mr. Diehl, General Freight Agent L. E. & W. Ry.
Mr. Mallott, General Manager L. P. & C. Ry.
Mr. Smith, General Freight Agent L. P. & C. Ry.
Mr. Bradley, Western Traffic Manager Wabash Ry.
Mr. Osborn, General Freight Agent Wabash Ry.
Mr. Potter, General Manager F. & P. M. R. R.
Mr. Edwards, General Freight Agent F. & P. M. R. R.
Mr. Noyes, General Freight Agent I. & S. L. R. R.
Mr. Gray, Asst. General Freight Agent L. S. & M. S. R. R.
Mr. Vaillant, Asst. General Freight Agent L. S. & M. S. R. R.
Mr. Howe, General Agent Grand Trunk Ry.
Mr. Spriggs, General Freight Agent Gt. Western Ry.
Mr. McLeod, General Freight Agent C. H. & D. R. R.
Mr. Grier, General Freight Agent Mich. Cent. R. R.
Mr. Duncan, General Freight Agent Ohio & Miss. Ry.
Mr. Meldrum, General Agent Penna. Co.
Mr. Fraser, General Freight Agent M. & C. R. R.
Mr. Perry, General Freight Agent Can. So. R. R.
Mr. Spiers, General Freight Agent T. P. & W. R. R.
Mr. Hibbard, General Freight Agent Vandalia Line.
Mr. Harris, General Manager N. Y., L. E. & W. R. R.
Mr. Wadsworth, General Agent N. Y., L. E. & W. R. R.
Mr. Dutcher, General Stock Agent N. Y. C. & H. R. R.

Mr. Fink said that the meeting had been called at the suggestion of the Eastern Executive Committee, in order to select a Joint Committee of the trunk lines and the Western roads, to be intrusted with the carrying out of the apportionment of the east-bound traffic between the competing lines, and the maintenance of rates, in conformity with a resolution passed at the Windsor Hotel, Dec. 9, 1878.

Mr. Fink made the following statement of the views of the Trunk Line Executive Committee in this connection:

TRUNK LINE STATEMENT.

The Executive Committee have had under consideration, for a long time, the necessity for some organization that would secure the cooperation of the Western roads with the trunk lines.

It will be remembered that the Western roads, in order to bring unity into their action, and to carry out their agreements, have from time to time petitioned the trunk lines to enforce the maintenance of agreed rates by charging arbitrary rates, and by cutting off roads that were not carrying out their agreements.

Efforts have been made by the trunk lines to meet the wishes of the Western roads, but they found it was impracticable. Even if the trunk lines charge the full proportion of the agreed rates upon their own roads, it would leave the roads west of the western termini of the trunk lines free to disturb the proper adjustment of rates, which would lead in the end to a general demoralization.

Some of the trunk lines own the western connections to Chicago, St. Louis and Cincinnati, and others do not. It can be readily seen that those roads owning the western connections would have greatly the advantage over those who do not.

For these reasons, the Trunk Line Committee concluded to abandon the proposed plan of influencing the Western roads; and this conclusion was communicated to them at their meeting at the Windsor Hotel on the 7th of March last.

It was then hoped that the agreement for a division of the east-bound traffic between the competing lines would secure the maintenance of rates; but this hope has also been dispelled, and the present plan for a more perfect arrangement, as agreed upon at the Saratoga meeting, has not yet been completed. In the meantime, as was to be expected, tariff rates are not being maintained.

The question now is, What measures can be adopted to maintain rates while the pool is being formed, and to maintain hereafter any agreements that may be made between the railroad companies?

It being acknowledged that the Eastern trunk lines cannot alone control the rates, the conclusion at which the Executive Committee has arrived is, to call in the aid of the principal Western roads to cooperate with the Eastern trunk lines. It is with this view that the Committee is to be formed, consisting of the representatives of the trunk lines as well as the Western roads, and which is to deal with the complicated and difficult problems that are to be solved.

A committee of this kind, to be effective, should consist of the fewest possible members, and should be so constituted that they can be brought together upon short notice. In fact, they must be able to remain together permanently if necessary.

The members of such Committee should not represent general interest, but particular roads; and they should be empowered by the highest authority of the road which they represent to guarantee the strict maintenance of tariff rates which have been established in the usual way, it being fully understood that no rates are to be changed by any one line or road thus represented, or that no rebates can be paid without the knowledge and consent of this representative, so that when he gives the assurance that the company he represents is maintaining rates,

there can be no sort of doubt about the truth of the statement.

The great difficulty in maintaining rates lies in the fact that the rate-making power is given to so many agents who are uncontrollable. These agents have general directions to meet any rates that may be made in the market, and even if they have only a suspicion that somebody else is about to make lower rates, they are directed to anticipate such action. It requires no argument to show that, as long as this system of doing business is in vogue, every attempt to maintain rates must be in vain.

The first step, therefore, to institute reform in this matter is to concentrate the rate-making power of each road in the hands of one man, and to have each man so empowered to cooperate with all the other roads, so that no rates can be changed, except by the joint action of all. Under such an organization the responsibility may be laid somewhere for a violation of agreement. At present, this is utterly impossible.

The Trunk Line Executive Committee submits these general views as to the necessity of a Joint Committee, and the manner in which it should act, to the consideration of this Convention.

THE JOINT COMMITTEE.

The following members of the Joint Committee were then appointed:

Representing the Western Executive Committee—Messrs. McCullough, McMullin, Newell, Ledyard, King, Hopkins, Devereux, Simpson, Seargeant, Broughton.

Representing the Eastern Executive Committee—Messrs. Rutter, Blanchard, Cassatt, King, Bentley.

It was understood that, in order to reduce the number of members so as to form a Committee that could be readily convened at short notice, and act promptly and effectively upon questions brought before it, two or more members having common interests might select one member as a substitute to represent them; and that such substitutes should be selected at the earliest possible day, and their names communicated to the Chairman.

PROCEEDINGS OF THE JOINT COMMITTEE.

The Joint Committee met and organized by electing Albert Fink Chairman and N. Guilford, Secretary.

On motion, a sub-committee, consisting of Messrs. Blanchard, Ledyard and Gray, was appointed to report a plan of rules and method of operation of the Joint Committee.

The sub-committee reported as follows:

JOINT COMMITTEE RULES.

1st. That this Committee be known as the Joint Executive Committee.

2d. It has been organized by the election of Albert Fink as permanent Chairman and N. Guilford as permanent Secretary.

3d. The general office of the committee shall be located at New York, and the Chairman and Secretary be authorized to incur such needful expense as is necessary to fulfill its purpose.

4th. It shall take cognizance of all through competitive freight and passenger traffic in both directions.

5th. Its object shall be the maintenance of agreed rates, and the abatement of expense on all such traffic by all initial and connecting lines.

6th. It shall convene at the call of the Chairman or any three of its members, on a notice of forty-eight hours when necessary; otherwise, such additional time shall be given as may be practicable.

7th. The point of meeting shall always be in New York when no other point is specified in the call.

8th. The object or objects of every special meeting shall be stated in each and every call therefor.

9th. Regular meetings shall be held in New York the third Tuesday of each month, unless the Chairman advises the members in the prior week that no business will be ready for presentation thereat.

10th. The Committee, or a majority of the Committee, or their representatives, shall constitute a quorum for the transaction of business.

11th. If at any time two-thirds of the members of the Committee, or their alternates or representatives authorized to act, are present, the Chairman shall act and vote for the members absent or those present who are not authorized to act.

12th. In case any question brought before this Committee fails to receive its unanimous action, such question shall be referred to the Chairman, who shall decide the case upon its merits, and whose decision shall have the same force and effect as the unanimous vote of the Committee.

13th. Any two or more of the members of the Committee, or their alternates or representatives, may meet and act with the Chairman upon questions local to them.

14th. All negotiations between the Committee and companies not represented by it shall be carried on solely through the Chairman.

15th. All companies are to make all complaints as to direct or indirect violations or evasions of rates, promptly, by wire and mail, to the Chairman of the Committee, accompanied, in all cases, with as much proof as may be obtainable.

16th. All companies, parties hereto, agree not to take any steps to meet alleged abatements or evasions of rates by other lines, until the Committee has acted thereon and announced its conclusions.

17th. The Committee is authorized and empowered to specify and enforce against all companies such rules and regulations for its purpose, as it may from time to time adopt, and the Committee or the Chairman acting therefor may call for all persons and papers it may desire.

18th. The Western members of the Joint Committee shall represent and act for all Western companies which the Western Executive Committee has heretofore represented or acted for.

19th. The Chairman of the Joint Committee shall ascertain promptly, and report as early as practicable what other companies, Eastern or Western, do or do not agree to be bound by its proceedings; and what member, alternate or representative upon the Joint Committee shall represent their several interests.

20th. In the event of any company's withdrawing its member upon the Committee, or the authority it has given any other member, alternate or representative to act therefor, it shall give not less than thirty days' notice to the Chairman; but this agreement shall nevertheless continue in force among the remaining parties hereto.

The plan of organization was unanimously adopted by the following vote:

Aye—Messrs. Newell, Ledyard, King, Hopkins, Simpson, Seargeant, Broughton, Gray (representing Mr. McCullough), James Smith (representing Mr. McMullin), Thomas (representing Mr. Devereux), Rutter, Blanchard, Cassatt and Bentley.

Mr. Broughton accompanied his affirmative vote with the following memorandum, which, at his request, was ordered to be entered upon the minutes:

"In behalf of the companies for which I act, I give my vote for the adoption of the report only on condition that the charging of the differential rates hitherto existing between the lake-and-rail and all-rail are not taken to be any breach of agreed rates."

CONVENTION PROCEEDINGS.

The convention met at 4:30 p. m.

Mr. Blanchard read to the meeting the plan of organization and rules of operation which had been adopted by the Joint Committee.

On motion, the report was received.

It was then announced that the difficulties heretofore existing in regard to a division of tonnage at Chicago were now removed by the consent of all the parties interested, to submit the question of percentages of division to arbitration.

On motion, the convention adjourned until Dec. 19, at 10 a. m.

CHICAGO, Dec. 19, 1878.

The convention was called to order pursuant to adjournment.

The Secretary read the following report of proceedings of a meeting of the Joint Committee, held since the last adjournment of the convention:

JOINT COMMITTEE PROCEEDINGS.

CHICAGO, Dec. 18, 1878.

The Joint Committee met at 9 p. m.

All members present, or represented, viz.: Messrs. Cassatt, King, Rutter, Seargeant, Blanchard, Bentley, Ledyard, Thomas (representing Mr. Devereux), Spriggs (representing Mr. Broughton), Mr. Gray (representing Mr. McCullough), Simpson, Smith (representing Mr. McMullin), Mr. Osborn (representing Mr. Hopkins), Mr. Fink, Chairman, Mr. Guilford, Secretary.

The following was then offered:

Resolved, That the Chicago east-bound freight be pooled between the Chicago lines upon such percentages as may be decided by arbitration, all Chicago lines having agreed to such arbitration; that the pool commence on the 19th day of December, and that tariff rates be restored on that day.

The resolution was submitted to the representatives of the Chicago lines, and was carried unanimously.

It was then unanimously

Resolved, That the east-bound through rates shall, on and after the 19th inst., be restored at all points to the tariff of Nov. 25, 1878.

The following was offered by Mr. Rutter:

Resolved, That the roads represented in this Committee will not, after this date, make or be parties to, or carry out any contracts or cuts of rates; and that all existing agreements or contracts shall be reported to the Chairman within one week from this date; and that no vouchers for rebates or drawbacks under contracts or agreements made prior to this date shall be paid, unless such contracts or agreements have been so reported, and such vouchers submitted to the Chairman and approved by him.

Carried unanimously.

It was then

Resolved, That the Indianapolis & St. Louis and Canada Southern Railway companies be invited to name representatives on this Committee.

Adjourned till to-morrow.

CONVENTION PROCEEDINGS.

On motion, the report was received and adopted.

On motion, the convention adjourned sine die.

JOINT COMMITTEE PROCEEDINGS.

The Joint Committee convened at 3 p. m.

The question of the issue of passes by Western roads to control freight shipments was discussed, and Chairman Fink was requested to obtain, if possible, the assent of the several companies to an agreement to issue no such passes after Jan. 1, 1879, and to report at the next meeting of the Committee.

It was then

Resolved, That the full inland tariff rates shall be charged to the sea-board upon all foreign shipments.

A communication was received from the Chairman of the Peoria Committee, stating that they had fully considered the differences which had arisen at that point, without arriving at an agreement for their adjustment, and that they desired to refer the whole subject of the apportionment of tonnage at Peoria, including percentages of division, the question of what tributary tonnage should be subjected to division, the means of carrying out the same, and all questions pertaining thereto, to the decision of the Joint Committee.

The communication was received, and it was then

Resolved, That a Committee of three be appointed by the Chairman to inquire into and report upon the subjects referred to this Committee by the Peoria lines.

Mr. Cassatt offered the following:

Resolved, That the Chairman shall prepare statistics referring to competitive traffic from Milwaukee, and that he shall make to this Committee a recommendation as to what action, if any, should be taken in the premises.

Carried.

On motion, adjourned. ALBERT FINK, Chairman.
N. GUILFORD, Secretary.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:
Philadelphia, Wilmington & Baltimore, annual meeting at the office in Wilmington, Del., Jan. 13, at 1 p. m.
Western Railroad Association, annual meeting, at the office of the Association, No. 101 Washington street, Chicago, Jan. 14, commencing promptly at 10:30 a. m.

Dividends.

Dividends have been declared as follows:
Richmond & Petersburg, 2 per cent., semi-annual, payable Jan. 6.
Concord & Portsmouth (leased to Concord), 3½ per cent., semi-annual, payable Dec. 28.
Delaware (leased to Philadelphia, Wilmington & Baltimore), 3 per cent., semi-annual, payable Jan. 2.
Mineral Range, 10 per cent. in stock to represent surplus earnings for 1878.
Cheshire, 1 per cent., semi-annual, payable Jan. 6.
Atchafalaya Branch (leased to Boston & Providence), 3 per cent., semi-annual, payable Jan. 1.
Atchison & Nebraska, 1 per cent. from surplus assets, payable on demand.
Boston & Lowell, 1 per cent., semi-annual, payable Jan. 1. The company paid 2 per cent. last July.
Eastern in New Hampshire, 8½ per cent., payable Jan. 8. This is the first dividend under the amended lease to the Eastern, of Massachusetts.
Lowell & Andover (leased to Boston & Maine), 8½ per cent., semi-annual, payable Jan. 1.
Boston, Revere Beach & Lynn, 3 per cent., payable Jan. 1. This is the first dividend since Jan. 1, 1877.
Pittsfield & North Adams (leased to Boston & Albany), 2½ per cent., semi-annual, payable Jan. 1.
Ware River (leased to Boston & Albany), 3½ per cent., semi-annual, payable Jan. 1.

Portland, Saco & Portsmouth (leased to Eastern), 3 per cent., semi-annual, payable Jan. 10.
Providence & Worcester, 2½ per cent., semi-annual, payable Jan. 1. The July dividend was only 2 per cent.

Mail Service Extension.

Mail service has been ordered on the following new lines or extensions of old lines, as follows:
Atchison, Topeka & Santa Fe.—Service extended from La Junta, Col., to Trinidad, 81.57 miles.
Southern Minnesota.—Service extended from Fairmont, Minn., to Jackson, 26.86 miles.
Chicago, Milwaukee & St. Paul, Hastings & Dakota Division.—Service extended from Glencoe, Minn., to Montevideo, 82.40 miles.
Chicago & Northwestern, Plainview Railroad.—Service ordered from Eyota, Minn., to Plainview, 16.28 miles.
Detroit, Lansing & Northern, Stanton Branch.—Service extended from Stanton, Mich., to Blanchard, 17.60 miles.
Toledo & Ann Arbor.—Service ordered from Toledo, O., to Ann Arbor, Mich., 45.62 miles.

Foreclosure Sales.

The Titusville & Petroleum Centre road was sold in Titusville, Pa., last week to satisfy a judgment for \$125, and was bought in for that amount by Mr. Carson, of Pittsburgh. The grading of the road is said to have cost over \$200,000, but no rails were ever laid upon it. The Pittsburgh, Titusville & Buffalo Company has, we believe, some claim on the property.

The Indianapolis, Bloomington & Western, Western Extension, will be sold in Springfield, Ill., Feb. 6, under the separate decree of foreclosure granted by the United States Circuit Court. The sale will include the line from Champaign, Ill., to Havana, 101 miles, with the branch from White Heath to Monticello, 31 miles, with the equipment adjudged to belong to the extension, consisting of 6 engines, 4 passenger and 3 baggage cars, 29 box, 14 stock, 12 flat and 4 caboose cars, with hand cars, etc. Terms of sale will be \$25,000 cash, the balance in money or bonds on confirmation of the sale.

Southwestern Railway Association.

The special committee of this association met in Chicago, Dec. 27, and decided to recommend the continuance of the agreement for another year. Only one change was made, the committee deciding that any road in the Association carrying an excess of tonnage over its allotment should be allowed 30 per cent. of the revenue therefrom for the expense of carrying, instead of 40 per cent., as heretofore.

The regular monthly meeting of the Association was held in Chicago, Dec. 28, when the report of the committee was adopted, extending the agreement for a year. It was also resolved to include lumber in the operations of the pool, and to restore rates on that article to 15 cents per 100 lbs. from Mississippi River points and 25 cents from Chicago.

Chicago Meeting on Passes.

In Chicago, Dec. 28, Trunk Line Commissioner Fink met the representatives of the following roads and they adopted the appended resolutions: Chicago & Alton; Chicago, Burlington & Quincy; Chicago, Rock Island & Pacific; Kansas City, St. Joseph & Council Bluffs; Hannibal & St. Joseph; Wabash; Missouri Pacific; St. Louis, Kansas City & Northern; Illinois Central; Chicago, Milwaukee & St. Paul, and Chicago & Northwestern.

The resolutions are as follows:

At a meeting of Western railroad managers held in Chicago on the 25th day of December, A. D. 1878, it was unanimously

Resolved, That no free passes shall be given to shippers of freight, their agents or representatives after Jan. 1, 1879; nor shall any form of ticket be sold or disposed of at less than regular tariff rates for the purpose or with the intent of influencing competitive freight or passenger traffic, it being agreed that the minimum rate for 1,000-mile tickets shall be three cents per mile.

Resolved, That the parties hereto will withdraw all books or forms of blank passes in the hands of their own or the agents of any other company.

Resolved, That the Secretary of this meeting prepare copies of this agreement for the signature of all parties hereto.

Resolved, That any violation of this agreement be communicated to the Secretary of this meeting, and before any party hereto shall violate the conditions herein prescribed he shall await the action of a meeting of all parties in interest.

The undersigned hereby assent to the foregoing agreement, and by their signatures appended hereto bind their respective companies to the faithful performance of the same.

The agreement was signed by the managers of all the roads represented at the meeting.

ELECTIONS AND APPOINTMENTS.

Cleveland & Pittsburgh.—At the annual meeting in Cleveland, O., Jan. 1, the following directors were chosen: James F. Clark, J. V. Painter, R. P. Ranney, Cleveland; E. M. Ferguson, Cincinnati; B. F. Jones, J. N. McCullough, Pittsburgh; Wm. Buckwell, Thomas A. Scott, Philadelphia; August Belmont, Charles Lanier, Samuel J. Tilden, F. T. Walker, New York.

Chicago, Burlington & Quincy.—Mr. George Alexander has been appointed Superintendent of the Chicago Division, in place of A. A. Hobart, resigned.

Detroit & Bay City.—Mr. D. D. Davis has been appointed Auditor to date from Jan. 1.

Dorchester & Delaware.—At the annual meeting recently the following directors were chosen: Thomas W. Anderson, John W. Brown, W. Wilson Byrn, Robert G. Ellgood, James Gore, E. W. Le Compte, John Webster. The board elected W. Wilson Byrn, President; Thomas W. Anderson, Secretary and Treasurer.

Maryland State Directors.—The Board of Public Works of Maryland recently elected the following directors for the state: Baltimore & Ohio, James A. L. McClure, Outerbridge Horsey, George Colton, Joseph Brinkley; Philadelphia & Baltimore Central, John Kearney; Kent County, William S. Walker, Samuel A. Merritt, Richard C. Johnson; Queen Anne's & Kent, Dr. Washington Finley, William McKenny, John R. Emory; Maryland & Delaware, Samuel Hambleton, Edward Lloyd, William C. Satterfield; Wisconsin & Peconic, Gen. Humphrey Humphries, Col. William Showell, Col. L. L. Derrickson; Eastern Shore, E. E. Jackson, William H. Gale, William H. Roach; Worcester, Dr. John T. Hammond, Littleton R. Purnell; Dorchester & Delaware, Hon. James A. Stewart, Edward Goslin; Worcester & Somerset, John P. Hargis; Annapolis & Elkridge, Augustus Gassaway, N. E. Berry, Owen Cecil; Chesapeake & Delaware Canal, J. Alexander Shriver.

Mineral Range.—At a meeting held in Hancock, Mich., Dec. 16, the board reflected Charles E. Holland, President;

R. M. Hoar, Vice-President; M. A. H. Viele, Secretary and Treasurer.

New York & Greenwood Lake.—Mr. John N. Abbott has been appointed General Passenger Agent and Mr. R. C. Vilas, General Freight Agent. They hold the same positions on the New York, Lake Erie & Western, which now controls this road.

Northeastern (South Carolina).—The officers of this company, chosen at the recent annual meeting are: President, A. F. Ravenel, Charleston, S. C.; Directors, C. O. Witte, W. B. Smith, Charleston; J. B. Palmer, Columbia, S. C.; B. D. Townsend, Winnsboro, S. C.; R. R. Bridgers, Wilmington, N. C.; W. T. Walters, Baltimore; Secretary, C. Willman, Charleston.

St. John & Maine.—The following circular from J. Murray Kay, Manager, is dated Saint John, New Brunswick, Dec. 21:

"I have to-day been notified by the London board of directors of my appointment as Manager of this road, and accordingly I assume the duties of that position from this date.

"All communications on general business should be addressed to me, Saint John, N. B., remittances being made payable to my order.

"All communications relating to traffic should be made to Mr. H. D. McLeod, Saint John, N. B., who continues to be Superintendent of the road.

"Mr. Alexander McNaughton will act as Accountant and Cashier, and all traffic reports and remittances should be forwarded to him at Saint John, N. B."

Santa Fe Canal.—At the annual meeting in Waldo, Fla., Dec. 17, the following officers were chosen: President, George C. Rixford; Vice-President, B. B. Ewing; Directors, Charles K. Dutton, H. Raulerson, Hiram Alderman; Treasurer, James L. Ferguson; Secretary, D. S. Place; Chief Engineer, Ned. E. Farrell.

Springfield & St. Louis.—The officers of this new company are: President, O. H. Miner; Vice-President, J. Taylor Smith; Secretary, B. Fox; Treasurer, George Pasfield.

Troy & Greenfield.—The board has elected Edward Appleton President; Fredrick L. Chapman, Clerk and Treasurer. The directors recently chosen are as follows, Edward Appleton, D. W. Gooch, Otis Clapp, Henry B. Rice, Herman Haupt, Francis L. Chapman, Asa P. Morse, Frank H. Forbes, Henry L. Sabin.

Wheeling & Lake Erie.—At the annual meeting in Norwalk, O., recently the following directors were chosen for three years: F. G. Lockwood, R. H. Cochran, L. W. Sutherland, W. A. Mack, D. A. Baker, Jr., was chosen for two years, in place of G. T. Stewart, resigned. The directors holding over are Joseph Bell, Joel Wood, J. W. Wickham, Jr., James Aiken, A. K. Robinson, T. W. Chapman, William Davidson and E. D. Otis. The board elected W. A. Mack, of Norwalk, O., President; F. G. Lockwood, of Milan, O., Secretary; D. A. Baker, Jr., of Norwalk, O., Treasurer.

PERSONAL.

—Gen. Daniel Craig McCallum died at his residence in Brooklyn, N. Y., Dec. 27, of congestion of the lungs. He was born in Scotland in 1815, but came to this country while yet a child and settled with his parents in Rochester, N. Y. There he learned the carpenter's trade, and for some years was an architect and builder. In 1851 he invented the arch-truss bridge known under his name, and soon after came to New York, where he employed himself as a bridge-builder. In 1855 he was appointed General Superintendent of the Erie, but left that road in 1857, to superintend the construction of bridges of his design, and was also Consulting Engineer of the Atlantic & Great Western. In 1862 he was made a Colonel in the Army and assigned to duty in connection with transportation, and early in 1864 was made Brigadier General and placed in charge of all military railroads, an extremely arduous and responsible work. At the close of the war he had under his charge 2,105 miles of road (over 600 built under his orders), equipped with 419 engines and a large number of cars. He retired, after his work had closed, with the rank of Brevet Major General, and has since lived in retirement, except for a time, when he was Inspector of the Pacific railroads. Gen. McCallum's work during the war was one of peculiar difficulty and requiring great executive ability, and he rendered very valuable service to the Government.

—Major W. F. Downs, General Superintendent of the Central Branch, Union Pacific, was presented with a valuable gold watch at Atchison, Kan., Dec. 24, by the officers and employees of the road.

—Mr. Edward Brooke, formerly President of the Wilmington & Reading Railroad Company, died in Reading, Pa., Dec. 25, after a short illness, of pneumonia. He was a member of the firm of E. & G. Brooke, owners of the Birdsboro Iron Works, the Hampton Furnace and extensive iron properties in Eastern Pennsylvania.

—Mr. A. A. Hobart has, it is said, resigned his position as Superintendent of the Chicago Division of the Chicago, Burlington & Quincy road.

—It is again reported from Cleveland that Gen. J. H. Devereux will resign the position of President of the Cleveland, Columbus, Cincinnati & Indianapolis, and that he will be appointed General Manager of all the Vanderbilt roads west of Buffalo.

—Rev. Dr. George P. Hays has sent in his resignation as President of Washington and Jefferson College and also as pastor of the Second Presbyterian Church of Washington, Pa., in order to devote his time to the extension of the Pittsburgh Southern Railroad, of which he is President. Among his reasons for this action is that a more active life may restore his health, now somewhat impaired.

—Mr. Thomas Redmond, an esteemed citizen of Quincy, Ill., died in that city Dec. 24, aged 74 years. For many years he was a railroad contractor, and built the old Northern Cross road, from Quincy to Clayton, besides many other works. He was a director of the Quincy, Missouri & Pacific.

—Mr. A. M. Smith, General Passenger Agent of the Chicago, Rock Island & Pacific road, resigned that position Jan. 1, after 23 years' service for the company. Mr. Smith intends to go to Arizona for a time, to look after some mining interests there. He has been a very active and enterprising officer.

—Ex-Governor Onslow Stearns, of New Hampshire, one of the most prominent and active of New England railroad men, died Dec. 28. He was born in Billerica, Mass., Aug. 30, 1811, and when 20 years old was employed in the construction of the Chesapeake & Ohio Canal. After working for several years on railroads in New York and New Jersey, he was, in 1838, appointed Superintendent of the Nashua & Lowell road. He took a prominent part in the building of the Northern, the Concord & Claremont and other New Hampshire roads, and for over ten years past has been President of the Old Colony Company. He was chosen to the New Hampshire

Senate in 1862, and was Governor in 1869 and 1870. Besides his position as President of the Old Colony, he was President of the Concord, the Northern and the Concord & Claremont, and director of several other companies.

—Mr. E. R. Burpee, since September last one of the Managers and previously Receiver of the St. John & Maine (formerly the New Brunswick Division of the European & North American) retires from the active management, although still remaining a director of the company. Mr. Burpee has been connected with the road from the beginning, and its construction was largely due to his efforts.

—Mr. George J. Whitney died at his residence in Rochester, N. Y., Dec. 31, in his 61st year. He was for many years a prominent grain-dealer and miller in Rochester, where he still owned mills and elevators, and for 15 years past has been a director in the New York Central & Hudson River Company. He superintended the building of that company's new elevators in New York, and had charge of their management since their completion. He leaves a widow, three daughters and one son, who was associated with him in business.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Eleven months ending Nov. 30:

	1878.	1877.	Inc. or Dec.	P. c.
Dakota Southern	\$200,234	\$191,357	L.	\$8,877 4.6
Philadelphia & Erie	2,035,753	2,015,247	D.	210,494 7.5
Net earnings	905,541	1,022,800	D.	117,319 11.5
Philadelphia & Reading	11,927,488	13,092,338	D.	1,164,850 8.9
St. Louis & South-eastern	1,080,070	1,007,101	L.	79,788 7.9
Net earnings	250,408	225,682	L.	30,746 13.6
Month of November:				
Dakota Southern	\$23,086	\$24,307	D.	\$1,221 2.6
Houston & Texas Central	408,132	340,000	L.	68,132 20.0
Net earnings	200,096	150,182	L.	110,114 7.3
Philadelphia & Erie	317,108	353,446	D.	36,278 10.3
Philadelphia & Reading	1,678,304	1,133,111	L.	545,283 48.1
Third week in December:				
Chicago, Mil. & St. Paul	\$180,000	\$188,740	D.	\$8,740 4.6
Chicago & Eastern Illinois	10,700	13,029	L.	3,731 28.7
St. Louis, Iron Mt. & Southern	119,000	154,210	D.	35,210 22.8
Wabash	82,075	91,510	D.	8,444 9.7
Week ending Dec. 20:				
Great Western	\$79,801	\$95,075	D.	\$15,184 16.0
Week ending Dec. 21:				
Grand Trunk	\$174,308	\$207,601	D.	\$33,293 16.0

Coal Movement.

Coal tonnages are reported as follows for the week ending Dec. 21:

	1878.	1877.	Decrease.	P. c.
Anthracite.....	305,930	485,633	119,694	24.6
Semi-bituminous.....	45,013	55,751	10,738	10.2
Bituminous, Pennsylvania.....	38,000	40,858	8,840	18.9

The Anthracite Board of Control met in New York, Dec. 27. The Lehigh Valley interest was represented by Dr. Linderman, who stated that he was only authorized to arrange allotments for the next month, and, as no business of that kind was before the meeting, he withdrew. The Board then resolved that it was useless to attempt to make any arrangement for 1879 in the absence of the Lehigh Valley representatives, and thereupon adjourned sine die.

Grain Movement.

For the week ending Dec. 21 receipts and shipments of grain of all kinds at the eight leading Northwestern markets have been, in bushels, for the past six years:

	1878.	1877.	1876.	1875.	1874.	1873.
2,982,744	3,219,829	2,711,045	2,231,724	1,872,271	2,872,104	

The shipments of the same markets for the same week have been:

	1878.	1877.	1876.	1875.	1874.	1873.
1,509,045	1,377,894	1,108,217	788,772	562,345	989,763	

All these shipments have been by rail, except such as went down the Mississippi, which are not reported separately. Rail shipments have not been so large before since May.

For the same week ending Dec. 21, receipts at the seven Atlantic ports have been:

	1878.	1877.	1876.	1875.	1874.	1873.
3,143,021	3,228,910	1,841,227	1,395,701	1,338,420	1,890,067	

The receipts are slightly larger than those of the previous week, and much larger than usual at this season. Of these receipts, 39.6 per cent. was at New York, 16.8 at Baltimore, 16.7 at Philadelphia, 15.6 at New Orleans, 9.4 at Boston, 1.8 at Portland, and 0.1 at Montreal. New Orleans receipts have been larger but three times this year.

Texas Car Load Regulations.

The Texas railroads, including the Galveston, Houston & Henderson, the Galveston, Harrisburg & San Antonio, the International & Great Northern, the Houston & Texas Central and the Texas & Pacific, give notice that, after Jan. 1, 1879, they will consider 20,000 lbs. a full car load. Cars loaded in excess of this, and up to 22,400 lbs., will be received, the excess over 20,000 lbs. to be charged at double class rates. When cars are received at connecting points with loads over 22,400 lbs., they will not be received until the excess is unloaded and put in other cars, at the expense of the line offering them. The only exception will be in the case of railroad iron, when 22,400 lbs. per car will be allowed without extra charge.

Upper Mississippi Traffic.

During the season of navigation, which lasted this year from March 15 to Dec. 10—270 days—there passed through the canal, around the Des Moines Rapids, in the Mississippi, at Keokuk, Ia., 1,224 steamboats, 705 barges and flats, and 29 rafts. The freight carried by these vessels was 82,374 tons general merchandise; 1,528,425 bushels grain; 21,795,963 feet lumber; 5,180,000 feet logs; 5,394,100 lath, and 13,514,000 shingles. Not a single accident happened on the canal during the season, and no delays worth mentioning occurred.

Texas Passenger Rules.

At a meeting held recently at Galveston, at which were represented the Galveston, Houston & Henderson, the Galveston, Harrisburg & San Antonio, the International & Great Northern, the Houston & Texas Central and the Texas & Pacific, it was resolved that, after Jan. 1, 1879, the practice of issuing passes, mileage tickets or any other inducements for securing business, either freight or passenger, be discontinued, and that no commission, salary or side-cut be paid to any agent of any other line to secure business. It was also agreed that general passenger and ticket agents shall not issue or furnish any special tickets free, or at reduced rates, and that such special tickets from any other line shall not be honored, except upon a special request from

the manager or superintendent of the line issuing the same. It was further agreed that rates for theatrical troupes, excursions and thousand-mile tickets shall be three cents per mile.

THE SCRAP HEAP.

Railroad Equipment Notes.

The Wason Manufacturing Co., at Brightwood (Springfield), Mass., last week delivered 10 passenger cars to the New York Elevated road, and five street cars of extra size to the Fort Hamilton line in Brooklyn. They have still in the shops some more cars for the New York Elevated, 10 for the Boston, Hoosac Tunnel & Western, three for a Michigan road, and nine to go to Peru.

The Ohio Falls Car Works, at Jeffersonville, Ind., have received a contract from the Utah & Northern road for three parlor cars, three combination cars, three mail and three baggage cars, 100 box, 75 flat and four caboose cars. This is said to be the largest contract ever given out for narrow-gauge cars.

The Louisville & Nashville shops at Louisville, Ky., are building a consolidation engine with 20 by 24 in. cylinders and 50 in. driving wheels. They are also building a new passenger engine and four passenger cars.

The Windsor Car Roofing Co., at Cleveland, O., made about 5,500 car roofs during the year 1878.

The Pittsburgh Car Works, which have been running on half-time for several months, recently began to run full time again.

The Harrisburg (Pa.) Car Works have reduced their working force for a time.

The Central Vermont shops, at St. Albans, Vt., have just turned out a new snow-plow weighing 32,000 lbs., with all the latest improvements.

John L. Gill, at Columbus, O., has a number of narrow-gauge freight cars to build for several different roads.

Iron and Manufacturing Notes.

The Ohio Nut and Bolt Works, at Cleveland, O., report large orders and a better prospect for business than at any time since 1873.

The Cuyahoga Steam Furnace Co., at Cleveland, O., recently completed a large steam hammer for the Albany & Rensselaer Iron & Steel Co. The anvil block for the hammer was cast by Neems & Son, of Troy, N. Y.

C. Coleman & Son, of Pittsburgh, are making 2,000 railroad wheelbarrows to fill an order from South America. Kline, Logan & Co., of Pittsburgh, are making 6,000 picks and shovels to go to South America.

John McAnerney & Co., of New York, dealers in iron and railroad supplies, have been obliged to make an assignment, in consequence of depression in the iron trade, the suspension of the Dutchess Iron Co. and other circumstances.

Mr. B. D. Hasell, of New York, has removed the railroad supply department of his business to No. 63 Broadway, and has secured for its conduct Messrs. John McAnerney and Henry St. George Offutt, members of the late firm of John McAnerney & Co.

The Indianapolis Rolling Mill is re-rolling a lot of iron rails for the Fort Wayne, Muncie & Cincinnati road.

The Southern States Coal, Iron & Land Co. has nearly completed its first blast furnace at South Pittsburgh, Tenn., and has made some progress on the second one.

A company is being formed to build a rolling mill at Toronto, Ont.

Briar Hill Furnace, near Youngstown, O., has gone out of blast to make some necessary repairs.

At Mount Hickory Furnace, near Sharpsville, Pa., one stack has gone into blast and another is being prepared to start.

The Glendower Iron Works, at Danville, Pa., are running full time, making 56-lb. iron rails.

Bridge Notes.

The Keystone Bridge Co., at Pittsburgh, has nearly finished the work on four large iron trestles for the extension of the Cincinnati Southern.

Claffen & Sheldon, of Cleveland, O., have just finished the iron work on the viaduct in that city. The total amount of their contracts was \$132,949.

Spikes.

The Pittsburgh Southern Railroad Company stands alone, we believe, in this country in having for its President a Doctor of Divinity, who is also President of a college and pastor of a flourishing church. A road out in Utah has a bishop for its President, it is true, but he is a Mormon, and the orthodox churches would probably object to counting him. It may be noted, however, that the gentleman in question seems to think his duties somewhat conflicting, and has decided to give up the college and the church to come down to railroading—a change not often made.

On a railroad lately finished (?) it is said that a trestle bridge was found to have moved three feet out of line after the first train passed over. Regular trains are not run yet.

Mr. Watson, Superintendent of the Danbury Branch of the Housatonic road, has been presented by his wife with a fifteen-pound baby. It is doubtful if the superintendent of a road 1,600 miles long could have done better than that.—*Danbury News.*

Good locomotives that used to bring \$24,000 can now be had for \$7,000. That's a big come-down, but it's not enough. What the age demands is a dollar-and-a-half locomotive to attach to the trousers seat of the errand boy. When that is accomplished, the world will have progressed one hundred years, and profanity received its worst setback.—*Norristown Herald.*

Prices of Rails.

At Philadelphia some weakening in prices of steel rails is noted, which is said to come chiefly from competition for some large orders considered especially desirable by the mill-owners. There are rumors of sales at \$40 per ton at mill, and \$42 per ton at tide-water is said to have been taken for one or two large orders. There is no scarcity of business offered.

Iron rails are reported unchanged; prices steady at \$32.50 to \$35, according to section, etc.

Old rails are just now in light demand and prices uncertain.

A New Oil Monopoly.

The Titusville (Pa.) *Herald* says: "The Producers' Grand Council, at their last meeting perfected the new scheme for limiting the daily sales of oil to the market requirements and retiring the surplus. The plan has been published in pamphlet form, and each member of the Union has received a copy. It, however, has not yet been submitted to the general public. A company is to be formed, called the American Petroleum Company, with a capital stock of \$20,000,000, represented by 20,000,000 shares of \$1 each. One-half of the capital shall always be held in trust, and shall be known as common stock. The remainder of the stock will be divided into various kinds of preferred stock. The company retains the right to redeem at par any certificate of first pre-

ferred stock, provided it shall give three months' notice. The affairs of the company shall be managed by a board of nine directors, chosen by the stockholders. The object of the company is to carry out such measures and plans as may be deemed expedient to secure by just and proper means the greatest practical advantages in producing, storing, manufacturing and marketing petroleum and its products, and to promote the general welfare and interests of all connected therewith. The full particulars of the plan being now before the producers, they will have ample opportunity to investigate its merits. The authors, confident of its practicability, fearlessly challenge criticism from any quarter."

A Historical Note.

Mr. C. P. Leland, Auditor of the Lake Shore and Michigan Southern road, sends to the *Detroit Post and Tribune* the following letter, which is compiled from official records made by Charles Noble, father of Charles W. Noble, of Detroit:

"CLEVELAND, Christmas-day, 1878.

"Thirty-two years ago to-day, Dec. 25, 1846, a board of directors met in Monroe, Mich., to accept from the state of Michigan the Southern road, running from Monroe to Hillsdale, 68 miles, purchased by the company for \$500,000. Here are the names of the directors:

"Edwin C. Litchfield, William A. Richmond, Tunis B. Van Brunt, James J. Godfrey (President), Samuel J. Holley, Charles Noble (Secretary), George W. Strong, Henry Waldron, Stillman Blanchard.

"After organizing, electing officers, etc., the board passed two resolutions, as follows:

"Resolved, That no credit be given for freight or passage.

"Resolved, That there be appointed two conductors or captains of trains, who shall also perform the duties of collectors of freight and passage money, at a compensation of \$40 per month.

"The Board felt that it would not do to select the two men hastily from among the numerous candidates, hence they referred the appointment to the executive committee for careful consideration.

"At the next meeting of the board, Jan. 9, 1847, the executive committee made their report, recommending the appointment of Timothy Baker for one of these conductors or captains of trains, also that Mr. Disbrow, whom the company had inherited from the state, be retained until the Hillsdale stockholders should elect the other conductor. The Hillsdale stockholders elected the late William Waldron, who had the inside track, as his brother, Hon. Henry Waldron, was a large stockholder and director.

"All this occurred thirty years, or one generation ago."

A Profitable Contract.

The Pensacola (Fla.) *Gazette* of Dec. 20 says: "We are reliably informed that the President of the Pensacola & Perdido Railroad Company has given notice to the Post Office Department that his road will cease to carry the mail after the 1st of January unless adequate compensation is allowed.

"The facts are these, that the Department allows a compensation of \$272.54 per annum for six days service per week from Pensacola to Millview and return, while owing to the distance of the post offices from the termini of the road, the railroad company pays the carriers as follows: To Pensacola P. O., \$216 per annum, and to Millview P. O., \$60, aggregating \$276, while the company only receives \$272.54 per annum."

President Lincoln on Free Passes.

The Bloomington (Ill.) *Pontograph* publishes the following letter addressed by Mr. Lincoln to Mr. Richard P. Morgan, when the latter was Superintendent of the Chicago & Alton road:

"SPRINGFIELD, Feb. 18, 1858.—R. P. Morgan, Supt. C. and A. R. R.—Dr. Sir: Says Sam to John, 'here's your old rotten wheelbarrow. I've broke it usin' on it. I wish you would take it and mend it, case I shall want to borrow it this afternoon.' Acting on this as a precedent, here's your old 'choked hat.' I wish you would take it and send me a new one, case I shall need to use it the first of March.

"Yours truly, A. LINCOLN."

Slow Time.

An old railroader relates this incident of the Union Pacific in its early days, when the running time was very slow:

A former employe of the road boarded a train and, as he knew the conductor, tried to cheek it through. General Manager Hoxie was on the train, and the conductor said he dare not pass the man, but referred him to Mr. Hoxie. The passenger applied to the General Manager, and his application to be passed was refused. He seated himself right in front of the Manager and refused to pay fare when the conductor came round again. The latter ordered him to get off at the next station, and when that was reached, the man did get off, but it was only to run around and climb into the baggage car, where he rode past several stations before the conductor entered and discovered him.

"This won't do," said the conductor, "Hoxie will be in here to smoke after a while and the devil will be to pay when he discovers you."

The man who was beating his way fixed that by hiding behind a lot of trunks, and from his position enjoyed a conversation with Mr. Hoxie, who had entered the car, was having about him with a friend. Finally the train entered the dining station, and the man behind the trunks got off to get something to eat. As he sauntered up the platform he came face to face with Mr. Hoxie.

"Here," said the latter, sternly, "I thought you got off at —," naming the station.

"So I did," was the reply.

"How did you get here, then?"

Taking Mr. Hoxie to one side, the passenger whispered, confidentially:

"I don't want to give your road and its slow time away before all these passengers, but I will tell you, privately, —I walked."

He got a pass for the rest of the journey, and to-day occupies a prominent position on the road, for which he is indebted to his cheek and wit.—*Detroit Free Press.*

OLD AND NEW ROADS.

Atchison, Topeka & Santa Fe.—This company made a general reduction in through and local passenger rates Jan. 1. The rate will hereafter be four cents per mile to all points on the main line and branches.

Boston, Clinton, Fitchburg & New Bedford.—A Boston dispatch of Jan. 1 says: "The Old Colony Railroad Company has leased the Boston, Clinton, Fitchburg & New Bedford Railroad for a term of 99 years. It is said that the Old Colony is to pay one-third of 32 per cent. of the gross earnings of both roads."

Boston, Hoosac Tunnel & Western.—The track of this road is now all laid from the junction with the Rensselaer & Saratoga at Mechanicsville, N. Y., eastward to Eagle Bridge, 21 miles, with the exception of a gap of about 300 yards at Schaghticoke Point, where proceedings to con-

demn the right of way have been delayed by legal technicalities.

A dispatch from Troy, N. Y., Dec. 31, says that Judge Osborn, of the New York Supreme Court, has given a decision affirming the right of the Troy & Boston Company as lessee to the road-bed of the old Albany & Northern road, on a part of which this company has laid some of its track. An appeal will be taken.

Chicago, Burlington & Quincy.—Track is reported laid on the Sidney Branch from Hastings, Ia., southwest to Sidney, 20 miles, with trains running. The contractors for this branch were Reynolds, Saulspough & Co., of Rock Island, Ill.

On the new Indianola Branch the rails are reported down from Chariton, Ia., the junction with the main line, north by west 20 miles, leaving about six miles to reach Indianola.

Chicago & Lake Huron.—The state taxes on this road, for the collection of which a warrant of sale had been issued by the Auditor General of Michigan, were paid Dec. 27. The amount was about \$38,000, and the money was advanced by parties interested in the road.

The *Detroit Post and Tribune* of Dec. 28 says: "We have what should be the very best authority for the statement that the negotiations opened some weeks ago between Vanderbilt and the Albany bondholders, whereby the former was to gain control of the Eastern Division of the Chicago & Lake Huron, have not been consummated. The loan negotiated for the payment of the state taxes does not at present affect the ownership of the road; it does prevent its immediate forced sale. There is still due about \$7,000 state taxes, for the payment of which 40 days remain."

Chicago, Milwaukee & St. Paul.—Notice is given that, under the provisions of the mortgage, 70 bonds of the consolidated sinking fund issue have been drawn for redemption and will be paid, at par and accrued interest, on presentation at the company's office in New York. Interest on the drawn bonds will cease July 1, 1879. The numbers of the bonds drawn are: 47, 93, 97, 137, 422, 532, 567, 827, 1152, 1487, 1556, 1577, 1765, 1860, 1925, 2086, 2169, 2201, 2245, 2402, 2411, 2497, 2566, 2638, 2654, 2731, 2818, 3052, 3063, 3404, 3424, 3437, 3443, 3566, 3602, 3794, 3896, 4074, 4205, 4359, 4472, 4657, 5051, 5219, 5329, 5514, 5642, 5732, 5891, 6042, 6090, 6231, 6255, 6312, 6320, 6328, 6605, 6640, 6699, 6757, 6880, 6976, 6999, 7001, 7014, 7172, 7215, 7282, 7295, 7359.

Columbus & Sunday Creek.—This company will receive until Jan. 7, proposals for the grading, masonry, trestle and timber work on eight miles of its road; there are about 13,000 cubic yards of tunnel work on the section. Proposals will be sent to J. G. Chamberlain, Chief Engineer, at Moxahala, O. The road was formerly known as the Ohio Central, and was sold under foreclosure some ten months ago.

Columbus, Chicago & Indiana Central.—The Trustees and Receivers are now paying, through A. Iselin & Co., No. 48 Wall street, New York, coupons due July 1 last on Columbus & Indianapolis preferred first, common first and second-mortgage bonds, and on Columbus & Indianapolis Central first-mortgage bonds.

Covington, Flemingsburg & Pound Gap.—Track on this narrow-gauge road has been laid to Hillsboro, Ky., 12 miles east by south from Flemingsburg, and 18 miles from the junction with the Maysville & Lexington road at Johnson. The extension passes through a country abounding in valuable timber. It was opened for business Dec. 17.

Dayton & Southeastern.—Receiver Gimpelring presents the following statement from Aug. 9, the date of his appointment, to Dec. 1:

Earnings to Nov. 1.....	\$20,693.21
" for November	7,677.02
Total.....	\$28,370.23
Expenses (57 per cent.).....	16,197.49
Net earnings.....	\$12,172.74
Rentals.....	\$1,428.00
Betterments.....	3,126.94
	4,552.94

Net surplus (27 per cent. of earnings)..... \$7,620.40
The chief expenditures for betterments were for ballasting, depots and iron for sidings.

Des Moines & Fort Dodge.—This company succeeded to the northern portion of the old Des Moines Valley road, and the land grant. A decision of importance to it is reported by the *Davenport (Ia.) Gazette* as follows:

"In the Humboldt County District Court, J. R. Duffie, Judge, in the case of the Dubuque & Sioux City Railroad Company vs. the Des Moines Valley Railroad Company to quiet title to overlapping land in the land grants, has given an important decision, which, if sustained, will overthrow all former decisions in the celebrated river-land cases, and upset all the sales of land heretofore made in Northern Iowa. The Valley road took the lands under the river improvement grant of 1846, and which was extended to the north line of the state, by act of Congress of 1862. The Dubuque & Sioux City took under the grant of 1853, made to the four East and West trunk lines. Judge Duffie holds that, under a treaty made with the Sioux Indians in 1830, by which the whole of what is now Northwestern Iowa was reserved by them, and which treaty did not expire until 1853, Congress had no power to grant such lands, and the Government had no title to it. Hence, as to the Des Moines River Improvement Company and the Valley Railroad Company, the grant was absolutely void as to the lands within the reservation, and the Dubuque & Sioux City holds a prior title under the act of 1853, the treaty having expired, to that under the grant of 1862 to the Valley road.

Indianapolis & St. Louis.—In the suit of the St. Louis, Alton & Terre Haute against this company, at Indianapolis, Dec. 24, the United States Circuit Court made an order directing that the money paid into court from the earnings of the Terre Haute road, under the order of Nov. 30, be applied: 1. To the payment of interest on the first mortgage bonds of the St. Louis, Alton & Terre Haute Company. 2. To the sinking fund provided for those bonds. 3. To the payment of interest on the preferred and income bonds of that company. 4. To the payment of interest on the equipment bonds of that company. The money paid into court is to be deposited in the Third National Bank of New York, and the bank is directed to apply it in the manner above set forth.

Indianapolis & Vincennes.—The following circular is issued by Mr. Thomas D. Messier, Third Vice-President and Comptroller of the Pennsylvania Company:

"The Pennsylvania Company having leased the Indianapolis & Vincennes Railroad, to take effect Jan. 1, 1879, it will be operated on and after that date in the name of 'Pennsylvania Company, operating Indianapolis & Vincennes Railroad.'

"Separate freight, ticket and mileage reports for this railroad should be forwarded to J. P. Farley, Auditor, Pittsburgh, Pa.

"Drafts for balances should be made on the undersigned separately from those for account of other roads operated by this company."

"All current balances of account owing to or by the Indianapolis & Vincennes Railroad Company, as of Dec. 31, 1978, will be transferred to the Pennsylvania Company, operating Indianapolis & Vincennes Railroad, and will be accounted for to or by said lessee."

The road extends from Indianapolis southwest to Vincennes, 117 miles, and has always been controlled and worked in the interest of the Pennsylvania.

Indianapolis, Bloomington & Western.—As noted last week, the United States Circuit Court has confirmed the sale of this road to the bondholders' committee. At the same time allowances to the trustee and counsel were ordered, amounting to \$45,074. Counsel for Turner Brothers objected to the overruling of their exceptions, and asked an appeal to the United States Supreme Court, which was granted, subject to the exceptions of the Farmers' Loan & Trust Company, and without prejudice to the same.

Kansas City, St. Joseph & Council Bluffs.—The Atchison (Kan.) Patriot reports that several of the officers of this road have been in Chicago for the purpose of negotiating a sale or lease of the road to the Chicago, Burlington & Quincy. There has been some talk of the building of a new line by the latter to Atchison, which would greatly damage the Missouri road.

Kansas Pacific.—In Washington, Dec. 27, argument was heard before Justice Miller, of the Supreme Court and Circuit Judge Foster, sitting as on circuit, on the motion to remand the foreclosure suit to the Kansas State Court, in which it was originally brought. The motion was supported by counsel for Adolphus Meier, Trustee, and several of the representatives of the junior encumbrances.

On Dec. 28 argument was heard on the questions of continuing the traffic or pooling contract with the Union Pacific and Colorado Central. Application to set aside this contract was made by Henry Villard, late one of the Receivers, on the ground that it had been made to work greatly to the disadvantage of the Kansas Pacific and to the gain of the other two companies. After some discussion, this was set over to the March term of the Court, and it was ordered that parties have leave to file affidavits and take testimony until Feb. 1.

A motion was then made to dissolve the injunction heretofore granted to restrain B. W. Lewis, Trustee, from prosecuting the suit begun by him in the Kansas State courts to foreclose the income mortgage. At the conclusion of the argument for the Trustee, the Court declined to hear further, and refused to dissolve the injunction.

Counsel for Henry G. Holmes presented a petition from that gentleman to be admitted as a defendant in the suit to foreclose the funding mortgage. This was opposed, and the Court reserved its decision.

Lafayette, Muncie & Bloomington.—Argument was heard by the United States Circuit Court at Indianapolis last week on the final decree of foreclosure against this road. The master's report on claims to be allowed was submitted and also argued. The final decree is expected next week, to which time the case was adjourned.

Legislative Passes in Massachusetts.—Several of the Massachusetts roads will not issue free passes this year to members of the Legislature. The Boston & Albany will sell a ticket good during the session between Boston and any point on its line in Western Massachusetts for \$40. The Boston & Maine, the Eastern and the Boston & Lowell will furnish members transportation at regular season rates, refunding full value for any unexpired portion of a ticket when it is surrendered. The Fitchburg, New York & New England and Old Colony roads have not taken any action as yet.

Madeira & Mamora Railroad, Brazil.—From San Antonio, the starting point of the Madeira & Mamora Railroad, Mr. Camille d'Inville, the Chief Engineer of the road, writes, under date of Nov. 26, to President Kennedy, of the Polytechnic College, Philadelphia: "I am now sure of a successful issue, and trust sincerely that I may have health to see the work completed. We have had but one death among the members of the engineer corps, Rodman McIlvane, who died at Manaus on his way home. But we have had much sickness, and that, and the expiration of their six months' engagement, took many home. Then the 'Acanga Pyanga' Indians made a sally on us, killed a cook, and scared so many that they would go into the woods; no more. About the same time, no money coming from England, I received orders to cut down the corps as soon as our surveys of the first seventy miles were completed. The voluntary action of so many of its members relieved me from that disagreeable task. Although, except in the survey line, very much has not been accomplished, yet I cannot look at the past ten months as wasted. The work ahead is very light and can be done rapidly. So far, with money matters tight, and no means of doing work, except with pick, shovel and wheelbarrow, it has been 'nip and tuck' to keep things moving at all; but this will all be changed. We have steam drills now, and an excavator will be here next month. Mules are coming from Para, and labor from Bolivia—labor which costs little and finds itself. Four hundred laborers have already arrived from Para who will answer our purpose very well for the present."

"Our maps go to Philadelphia this month and may be seen at the office of the company. I have been anxious to prepare a set for the college, but between sending 70 feet of tracing linen to England, then an equal amount to Rio Janeiro, and now to Philadelphia, I have had my hands full. Regarding the geology of this part of Brazil, I can say but little. The country rock is granite, much of it of the porphyritic variety. Deposits of sand are numerous, many of them containing magnetic oxide of iron. The bed of the Madeira and especially of its branches is largely sand, exposed at low water and then becoming large islands. From this level the water during freshets rises 45 feet, changing not only the aspect of the river but its channel and currents."

"I hope that this will find you well and the college progressing. I cannot hope to see you for two years, but if I can see you then in good health, and with the word that trains are running from San Antonio to Guajara Menni, it will be the proudest and happiest day of my life."

Manitoba & Hudson's Bay.—A dispatch from Ottawa (Canada) says: "A stupendous scheme for the colonization of the Northwest and the establishment of an ocean route for trade purposes between Europe and the Saskatchewan Valley via Hudson's Straits, has just been submitted to the Government by Surveyor-General Dennis. The report shows the feasibility of running a line of steamers between Liverpool and Hudson's Bay in the months of July, August and September. York Factory, the chief post on Hudson's Bay, is nearer Liverpool than New York, the distances being as follows: York Factory to Liverpool via Hudson's Straits and Cape Farewell, the southern point of Greenland, 2,966 miles; New York to Liverpool via Cape Race and Tory Island, 2,987 miles; via Cape Race and Cape Clear, 3,029 miles. York Factory is at the mouth of the Nelson River, and it is proposed to build a railroad thence to Prince Albert, on the Saskatchewan, to connect

with the Canada Pacific, a distance of 400 miles. This would bring the Saskatchewan Valley as near to tide-water as Ontario is to tide-water at Quebec. For 200 years Hudson's Bay Company's sailing ships have traded between York Factory and Scotland. The Straits and Bay are clear of ice early in July, closing again at the end of September. Lignite coal is found in abundance at Davis Strait, and a coaling station for the projected steamship line could be established there. The Saskatchewan country contains 257,000,000 acres, or 400,000 square miles, of available agricultural land. It is watered by the Saskatchewan, Beaver, Peace and Athabasca rivers and innumerable smaller streams, and it is believed to be the best wheat-growing region on the continent. Wheat of the finest quality grows at Fort Providence, on Great Slave Lake, on the fifty-eighth parallel, the extreme northern point of this vast territory. Colonel Dennis also points out that this scheme would lead to the development of the Hudson's Bay fisheries and to the enormous pineries extending from the height of land northward to James and Hudson's Bay. He recommends that a steam vessel be fitted out during the coming season to test the practicability of the scheme."

Missouri, Kansas & Texas.—The Union Trust Company, Trustee in possession, makes on and after Jan. 1, a payment of \$25 upon the coupons due at that time on such bonds of the Union Pacific, Southern Branch, as have been stamped, subject to the agreement of March 1, 1876.

Missouri Pacific.—In the New York Superior Court, Dec. 30, a decision was rendered in the case of Peter Marie and others against Cornelius K. Garrison, upon a demurrer to the complaint argued in November. The plaintiffs held in their own right and in trust for disposition 36,000 shares of stock of the Pacific Railroad of Missouri. Mr. Garrison, who held a majority of the third-mortgage bonds, began foreclosure proceedings in January, 1876. The shareholders, including plaintiffs, contested the foreclosure on the ground that the bonds were collusive and fraudulent, and the mortgage unauthorized. With a view of compromise, and to prevent the plaintiffs from defending against the foreclosure, Mr. Garrison, in March, 1876, entered into an agreement with the plaintiffs by letter, which was subsequently modified, whereby they withdrew their opposition to the foreclosure and Mr. Garrison was to buy the railroad on the foreclosure sale and to organize a new company with \$8,000,000 capital stock, and after providing for the bondholders to issue to the plaintiffs, in return for the 36,000 shares of the old company held by them, a like number of shares of the new company. The plaintiffs performed their agreement, and in consequence Mr. Garrison was enabled to procure a judgment of foreclosure, and the road was sold Sept. 18, 1876. James Baker, attorney for the road, purchased at the sale for Mr. Garrison. They organized a new company by the title of the Missouri Pacific Railway Company, Mr. Garrison becoming its President. The plaintiffs say he then refused to perform his agreement or to allow them any interest in the new company, and they claim \$3,600,000 damages. Judge Speir, in an elaborate opinion, overruled the demurrer, with costs.

New Jersey Midland.—Argument on the decree of foreclosure before the Chancellor of New Jersey was continued this week, and is not yet concluded, several counsel remaining to be heard. The holders of the lower bonds put in the claim that all the mortgages are illegally executed, thus doing away with the mortgage liens and making the bondholders simply creditors of the company. Argument will probably be finished this week.

New York & Greenwood Lake.—The connecting track near the west end of the Bergen Tunnel having been completed, the trains of this road began on Jan. 1 to run to Jersey City over the track of the New York, Lake Erie & Western road, and to use the terminal facilities of that road in Jersey City and New York. Heretofore trains have run from West End Junction to the Jersey City ferry over the New Jersey Midland and Pennsylvania tracks. The New York, Lake Erie & Western holds a controlling interest in the present company, through purchase of first-mortgage bonds of its predecessor, the Montclair & Greenwood Lake.

New York & Philadelphia New Line.—A Philadelphia dispatch of Dec. 31 says: "To-day's details of the agreement between the Philadelphia & Reading, the North Pennsylvania, the Bound Brook and the New Jersey Central railroad companies, by which the Reading road is to be allowed to make connection with the track of the North Pennsylvania, by means of its Richmond Branch, were consummated, and a force of workmen were set to work to commence operations. It is believed that in ten days the work will be completed. In the meantime a temporary arrangement has been effected by which coal trains of the Reading road will be run through to New York."

New York Elevated.—Regular trains began to run through to the new terminus at 129th street (Harlem) Dec. 30. The station there is not quite completed as yet, causing a little delay in running trains. Work is progressing as fast as possible on the Chatham street branch, and it will be ready for trains in a short time.

New York, Lake Erie & Western.—The first standard-gauge freight trains started from Jersey City and Buffalo Dec. 31 and will be run through with only necessary stops. They are drawn over the various divisions of the road by the new standard-gauge consolidation engines, a number of which are already delivered and in use.

On Jan. 1 the company added to its roads controlled and worked the 42 miles of the New York & Greenwood Lake, as noted elsewhere.

New York & Oswego Midland.—The repair shops at Middletown, N. Y., were burned on the night of Dec. 26, all the tools being destroyed or badly damaged. Two locomotives and the stock of lumber were also destroyed, but three other locomotives were hauled out in safety. The fire, which is supposed to have been purposely started, was seen soon after it commenced, but little or no water could be had. The loss is estimated at \$35,000, and is covered by a floating policy.

On the morning of the same day the round-house at Oswego was burned, causing a considerable loss. Five engines and four cars were destroyed or damaged.

Northern Pacific.—The following is a list of the bidders on the contract for grading the extension of 205 miles from Bismarck to the Yellowstone: Samuel P. Sheldor, Minneapolis, Minn.; P. Keating & Co., Pittsburgh; George R. Chittenden, Chicago; McArthur Brothers, Chicago; S. A. Harrison & Co., Milwaukee; Langdon & Co., St. Paul, Minn.; De Graff & Co., St. Paul, Minn.; Wm. L. Patterson, Sterling, Ill.; Bellows & Campbell, Rochester, N. Y.; Willis Phelps & Co., Springfield, Mass.; John A. McLean & Co., Bismarck, Dakota; Samuel Walton, Cumberland, Md.; Henry, Reed & Sanger, Joliet, Ill.; Reynolds, Saulpaugh & Co., Rock Island, Ill.; C. C. Smith & Co., La Crosse, Wis.; Wilson & Co., Philadelphia; Harris Brothers & Co., New York; R. R. Bridgers & Co., Jersey City; Condon & Harris, Jersey City; T. C. Platt, Skinner

& Co., Oswego, N. Y.; Miller, Savage & Co., Lykens, Pa.; T. E. Canda and John Ross, New York; Van Duser, Woods & Co., Rochester, N. Y.; Driesbach, Doty & Co., Somerville, N. J.; Donahoe & Shields, Flemington, N. J.; G. W. Cram, Norwalk, Conn.; J. J. Newman & Co., Brooklyn, N. Y.; Walker & Clark, Peekskill, N. Y.; Lawrence & DeWolf, Minneapolis, Minn.; Bassett & Lovejoy, Minneapolis, Minn.; George A. Brackett & Co., Minneapolis, Minn.; J. R. Price & Co., Oskaloosa, Ia.; J. R. Black & Co., Philadelphia; F. A. Page & Co., New York; J. H. Dewees & Co., Pittsburgh; Samuel McDonald, Pelican Lake, Minn.; Eustis & Day, Minneapolis, Minn.; Wm. Chandler, Minneapolis, Minn.; Patterson & Lassell, Adrian, Mich.; Henry Collins, Detroit; Peterson & Anderson, St. Paul, Minn.; Nelson McNeil, Eau Claire, Wis.; Gillett, Fritz & Sherer, Hudson, Wis.; Donald Stevenson, Mason & Co., Bismarck, Dakota; Hack, Hadley & Guptill, Fargo, Dakota; J. B. McLean & Co., New Tacoma, Wash. Ter.

It is stated that only 100 miles will be let at present, the other half of the proposed extension being held to await a new survey and location.

Paraguay.—The only railroad in this South American republic is the line from Asuncion to Paraguay, 45 miles, which was built for the government by Waring Brothers, of London. The government afterward sold the road for \$1,080,000 to private parties, but they, being now without the experience or capital needed to work it, offer it for sale for \$450,000. The Brazilian Government holds a mortgage for \$80,000, the only incumbrance, which will be made a part of the purchase money. On account of want of equipment, only three trains a week are now run, but the business could be largely increased with proper facilities. It is also proposed to extend the road from Paraguay to Villa Rica, 46 miles, and 11½ miles are already graded. It will then connect the three principal cities of the country, Asuncion, the capital, having 35,000, Paraguay 20,000, and Villa Rica 30,000 inhabitants. The last-named place is the centre of the tobacco and tea-growing districts and sends to the river by ox-cart about 75,000 tons of freight yearly. With railroad transportation this could be largely increased, it is said, as there is a demand for dye-woods, grain, hides, lumber, fire-wood and tan-bark, which abound in the country, but for which the ox-cart is too expensive a means of transportation. The government has granted the company all the land for one mile on each side of the road from Asuncion to Paraguay, and for two miles on each side from Paraguay to Villa Rica, and for any branches or further extensions which may be built; also exemption from all tax and the right to import railroad material free for 20 years. The company is represented in New York by Señor H. C. Fernando Robe, whose address is Box 4, 160, New York.

Peninsular, of Florida.—A correspondent writes: "Tracklaying commenced at Waldo, Fla., on Dec. 18, amid great rejoicing and a large concourse of people. The road-bed was graded over 20 years ago. The distance from Waldo to Orange Lake, 22 miles, will be laid this winter, and the remainder to Ocala, 21 miles, will be finished next summer." Waldo is on the Atlantic, Gulf & West India Transit road, 84 miles from Fernandina, and 71 miles from Cedar Keys.

Philadelphia & Reading.—This company's statement for November and the year ending Nov. 30, is as follows:

	1878.	1877.	1878.	1877.
Gross earnings:				
Railroad traffic	\$1,356,831	\$934,058	\$1,139,593	\$1,142,911
Canal traffic	219,929	118,479	1,016,337	1,011,509
Steam colliers	82,871	60,081	570,072	552,454
Rich'd barges	18,763	13,893	111,491	131,778
Total R.R. Co.	\$1,678,394	\$1,133,111	\$1,321,493	\$1,338,652
Coal & Iron Co.	1,129,082	954,386	8,192,078	10,007,032
Total	\$2,807,476	\$2,087,497	\$21,423,571	\$23,345,684
Traffic:				
Passengers	471,192	489,635	6,376,413	6,674,889
Tons merchandise	271,141	246,849	3,169,948	3,151,029
Tons coal	803,807	665,480	5,900,140	7,255,317
Tons coal on colliers	48,834	58,771	574,961	560,368
Tons coal mined:				
By Coal & Iron	378,590	372,247	2,727,608	3,794,328
By tenants	144,054	133,941	1,100,181	1,380,109
Total	522,644	506,188	3,827,789	5,174,437

The increase in road earnings for November came entirely from the increase in coal traffic.

The employees of this road are now receiving the scrip issued by the company for their back pay. It is in the following form:

"PHILA. AND READING P. R. CO. WAGES CERTIFICATE.
"No. ——— PHILADELPHIA, December 16th, 1878.

"The Philadelphia & Reading Railroad Company promise to pay to the bearer hereof the sum of Ten Dollars on the Fifteenth day of April, 1879, with interest from date without defalcation, for value received."

"This note is issued for wages due by the Philadelphia & Reading Railroad Company, and will be received either before or at its maturity for the amount due thereon in payment for freight and toll bills of the Philadelphia & Reading Railroad Company, for coal bills of the Philadelphia & Reading Coal & Iron Company, or any other debts due to either of the said Companies."

"\$10.00. "F. R. GOWEN,
"President."

"S. BRADFORD,
"Treasurer."

Payment in cash of the December wages and of interest allowed on arrears is promised about the middle of January. The sum allowed for interest is 5 per cent. on one month's pay to each man. The scrip is said to be taken freely by merchants and others along the line at 5 per cent. discount.

Philadelphia, Wilmington & Baltimore.—President Hinckley of the Philadelphia, Wilmington & Baltimore Railroad Company, being called upon yesterday in reference to the matter (the Baltimore & Ohio's reported new line to New York), said: "The published report that a meeting of railroad officials, including representatives of our company, was held at this office for the purpose of considering a project for a through connection, is wholly untrue. Our company has not been represented at any such meeting, and I do not know that a meeting with that object in view has been held. Furthermore, no officer of our company has been consulted, directly or indirectly, concerning such a scheme, or has officially said or intimated that this company would help to promote the plan—if any plan existed. The only thing coming from us that might be construed as bearing upon the matter was an affirmative answer from myself when asked whether we would deliver freight to the Reading Company. Of course we would. Why shouldn't we? When I read the reports I supposed that it was a stock-brokerage operation, and, sure enough, the New Jersey Central stock rose on account of the rumor, and so did the securities of the Bound Brook road."

As one difficulty in the way of establishing the through connection, Mr. Hinckley referred to the fact that about a mile of the track needed in the Junction Railroad, com-

mening at the north side of Market street and extending to a point near Thirty-fifth street, had been declared by the court to belong to the Pennsylvania Railroad Company. He could easily see, however, that the Reading company would gain by a junction with the North Penn, even though a project of the Baltimore & Ohio to connect with New York should fail. "If the Reading and North Penn should connect," said President Hinckley, "President Gowen could choose between two competing lines, which of them should carry his coal to New York in winter."

Mr. Hinckley remarked that there seemed to be a misunderstanding outside of railroad circles concerning the affairs of the Junction Railroad. It extends from Gray's Ferry to Belmont. While practically controlled by the Pennsylvania, Reading and Philadelphia, Wilmington & Baltimore Companies, it is really owned by a distinct corporation, of which Mr. Hinckley is President. The Junction Company has no rolling stock of its own, but charges each of the companies that use the track a fixed rate—forty cents a mile—for each car.

That the Philadelphia, Wilmington & Baltimore Railroad would gain from the establishment of a new through route Mr. Hinckley regarded as improbable. The result, he thought, would be nothing more than a division between the Pennsylvania and Bound Brook lines of the freight that was now arriving here by the Philadelphia, Wilmington & Baltimore. "This question of giving a road two outlets," he said, "is extremely intricate. In one view it has many advantages; in another, many objections, and to the public it is an unmitigated evil. A man who has only work enough for one horse should not keep two in his stable. I have seen freights at an intermediate station higher than at towns above and below, because the first place had to pay toward the support of a competing road. We don't even need the new line between Philadelphia and New York. One can do all the work, and, in the end, do it cheaper than two can, for the cost of these railroad wars must, sooner or later, be borne by the public. Should the Pennsylvania's New York branch and the Bound Brook line carry on a cruel war for a sufficient length of time, either one of them must be absorbed by the other. Their case is different from that of the Pennsylvania and the New York Central, each doing an immense local business. There's no getting around the axiom of George Stephenson, 'Where combination is possible competition is impracticable.'"—Philadelphia Times.

Pittsburgh Southern.—This company begins this week to run regular trains between Pittsburgh and Washington, Pa. The Waynesburg & Washington will be operated in connection with this road, making a continuous line of narrow gauge from Pittsburgh to Waynesburg, 52 miles.

Portland & Ogdensburg, Vermont Division.—At a meeting held in St. Johnsbury, Vt., last week, the plan of reorganization, substantially as heretofore noted, was agreed to by all the parties in interest, and it was agreed that the earnings for three years shall be applied to putting the road in good order and paying the Receiver's debts. The hearing on the petition of the Receivers for leave to borrow \$500,000 was adjourned by the Court to Jan. 30, to allow the completion of the plan. Ex-Gov. Fairbanks and Thomas Coggeshall, of Vermont, were added to the bondholders' committee to represent the floating debt creditors.

St. Louis & Southern.—Auditor Young's report for November is as follows:

	St. Louis Division.	Kentucky Division.	Tennessee Division.	Entire Line.
Earnings.....	\$61,831.21	\$33,488.21	\$15,466.04	\$110,785.46
Expenses.....	40,769.14	20,338.82	11,043.93	72,151.91
Net earnings.....	\$21,062.07	\$13,149.39	\$4,422.11	\$38,633.57
Per cent. of exps.	65.63	60.87	71.60	65.37

As compared with November, 1877, the entire line shows an increase of \$17,185.06, or 18.4 per cent., in gross, and of \$7,594.73, or 37.6 per cent., in net earnings.

Santa Fe Canal.—On this canal, one-half the distance from Waldo, Fla., to Lake Alto, is finished, and the lake will probably be reached in March. Work is now progressing with an Alger steam dredge through a heavy cypress swamp. The channel is made seven feet deep and 35 feet wide.

Sioux City & Pembina.—This road was to be opened Dec. 30 through to Beloit, Ia., which is 15 miles beyond the late terminus at Eden, 54 miles from the junction with the Dakota Southern at Davis Junction, and 67 miles from Sioux City. The opening was to be marked by a celebration at Beloit and an excursion over the road. The line is leased by the Dakota Southern Company.

Southern, of Long Island.—Suit has been begun to foreclose the second mortgage for \$1,500,000 on this road. The proceeding is in accordance with an agreement between the bondholders, under which the first mortgage for \$750,000 is to remain, holders of second-mortgage bonds to receive 60 per cent., and holders of the \$300,000 third-mortgage bonds 40 per cent. of their bonds in new income bonds or preferred stock. The foreclosure is necessary to carry out the plan.

The road, which is leased to the Long Island Company, extends from Brooklyn to Patchogue, 51½ miles, with 11 miles of branches. It was originally the South Side Railroad, and was once before (in September, 1874), sold under foreclosure.

Uniontown & West Virginia.—It is reported that work has been begun on the extension of this road from Olyphant Furnace, Pa., southwest to the Monongahela River and then southward up that stream to Morgantown, W. Va. The distance is about 15 miles. About three miles, from Olyphant Furnace to Smithville, are to be built at once.

Western Maryland.—The Baltimore Gazette of Dec. 25 says: "At a special meeting of the directors of the Western Maryland Railroad, held yesterday, it was determined to pay the interest on the first preferred mortgage bonds of the road indorsed by the city. The bonds amount to \$600,000, or which \$200,000 are indorsed, and the interest thereon has been paid by the city. The interest on the bonds will be \$36,000 per annum, and the payment by the road of its own interest will save annually \$12,000 to the city, that amount having formerly been paid by the city on the indorsed \$200,000 of bonds. This action of the directors indicates an early settlement with the city for the interest paid heretofore on the indorsed bonds. The total amount paid annually by the city on indorsed first and second-mortgage bonds is \$82,500. It will be remembered that at a recent meeting of the city Finance Commissioners, at which the proposition for the purchase of the second preferred bonds was disposed of, it was represented by the officers of the road that they would have the coming year a balance of \$50,000 above expenditures to be applied to the payment of the interest on the first and second-mortgage bonds. The city owns \$3,175,000 first, second and third-mortgage bonds, and \$200,000 common stock of the road."

Wheeling & Lake Erie.—At the recent stockholders' meeting in Norwalk, O., a change of management was

made, and it was resolved to make an effort to go on with the work on the road. A committee was appointed to see if a compromise could be made with the creditors, as a preliminary step.

Willamette Valley.—This road, formerly the Dayton, Sheridan & Grand Ronde, has now 23 miles of road in operation, from Dayton, Oregon, at the head of navigation on the Yamhill River (a few miles west of the Willamette) to Sheridan. A branch has also been completed from Junction, 14 miles from Dayton, southward to Dallas, 13 miles. This branch is to be extended next year from Dallas southward to Corvallis in Benton County, about 25 miles.

Wisconsin Central.—In the United States Circuit Court at Milwaukee, Dec. 28, suit was begun by Jesse Hoyt, Trustee, under the mortgage of the Milwaukee & Northern Railroad, against that company and the Wisconsin Central as lessee of the road. The complaint charges that the Central has failed to pay over a proportion of the earnings of the leased road, as provided for by the lease, and that both companies are insolvent. The Trustee asks that the Central be required to account for the proportion of earnings due and not paid, and that it may be enjoined from making any payments, except for necessary current expenses, until such an accounting can be had.

The following "General Notice to All the Employees" of this road was issued and signed by General Manager Finney and Superintendents Campbell and Dutton:

"Christmas will be observed as a general holiday by all connected with this road."

"All trains (except passenger) will be canceled on that day, and all employees, with their wives and sweethearts, will be carried free on all trains, from Tuesday morning, Dec. 24, until Thursday night, Dec. 26, and it will be only necessary for them to satisfy the conductor that they are employees to secure a free ride."

"It is our wish that every one may participate in the observance of the festivities of the glorious old day."

"We wish you all a Merry Christmas."

ANNUAL REPORTS.

Boston, Clinton, Fitchburg & New Bedford.

This company owns a line from Fitchburg, Mass., to New Bedford, 91.02 miles, with 34.81 miles of branches; it leases the Framingham & Lowell road, 26.12 miles, making 125.33 miles owned and 151.45 miles worked. It runs trains between Fitchburg and Boston, using the Boston & Albany track between Boston and South Framingham. The present company was formed in 1876 by the consolidation of the Boston, Clinton & Fitchburg and the New Bedford companies, and its latest report is for the year ending Sept. 30, 1878.

The balance sheet is as follows:

Common stock.....	\$1,279,000.00
Preferred stock.....	1,750,100.00
Total stock (\$24.317 per mile).....	\$3,047,700.00
Bonds (\$25.386 per mile).....	3,169,100.00
Bills payable, secured by pledge of \$250,000 bonds not sold.....	846,149.45
Accounts and balances.....	244,899.54
Boston, Clinton & Fitchburg stock not exchanged.....	44,175.00
Total.....	\$7,352,023.99
Construction (\$47.798 per mile).....	\$5,990,481.65
Materials, cash and balances.....	312,792.02
Bonds not sold.....	238,000.00
Notes, stock and advances, leased roads.....	394,533.92
Sinking fund.....	60,517.98
Profit and loss.....	95,078.41
Total.....	7,352,023.99

Of the bonds \$1,441,500 bear 6 per cent. and \$1,721,000 bear 7 per cent. interest, making the annual charge \$206,960 or \$1.651 per mile owned.

The earnings for the year were as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Passengers.....	\$357,291.94	\$391,899.58	D.	\$34,577.64 8.8
Freight.....	557,090.11	566,807.22	D.	30,147.11 6.6
Mail and express.....	26,294.16	29,186.03	D.	2,891.87 9.9
Rents, etc.....	29,302.04	28,391.21	I.	910.83 3.2
Total.....	\$970,548.25	\$1,046,284.04	D.	\$75,735.79 7.2
Expenses.....	693,016.52	804,012.32	D.	130,095.80 14.9
Net earnings.....	\$286,631.73	\$242,241.72	I.	\$44,390.01 18.3
Gross earnings per mile.....	6,408.37	6,908.25	D.	499.88 7.2
Net earnings per mile.....	1,892.58	1,599.48	I.	293.10 18.3
Per cent. of exps.....	70.47	76.85	D.	6.38 8.2

Expenses include the renewal of 12.47 miles with iron and 9.20 miles with steel, and 48,012 new ties. The income account was as follows:

Net earnings.....	\$286,631.73
Rentals.....	28,276.78
Interest on funded debt.....	175,029.00
Interest on unfunded debt.....	94,213.65
Total.....	297,519.43
Deficit for the year.....	\$10,887.70
Balance from previous year.....	84,760.71
Total debit balance.....	\$95,678.41

There was a decrease of 42,484 tons in coal carried, but the tonnage to and from other roads increased from 400,829 to 444,763 tons. Freight earnings were seriously affected by the low rates on New York business.

A new brick depot was built at Leominster, the New Bedford wharf enlarged and several new tools put in the Taunton shops, all being charged to expenses except \$1,064.92 paid for land. The road and equipment are in good order, and ready for a larger business.

The report says: "The deficit on this year's business arises from the payment of interest on the old notes of the company, which have since been converted into guaranteed stock. As explained in our last report, the note-holders finally determined to take the stock, provided that the holders of not less than \$700,000 of the Boston, Clinton & Fitchburg 8 per cent. bonds and Mansfield & Framingham 8 per cent. notes would reduce their rate of interest to 6 per cent., thereby relieving the company of \$17,400 annual interest. This arrangement was consummated Feb. 14, 1878, by the surrender of \$848,000 out of \$870,000 8 per cent. notes, and the stock was issued on that date. The net earnings of last year would leave a surplus of \$45,000 after paying the present entire interest account, both bonded and floating."

New York, Providence & Boston.

This company owns a line from Providence, R. I., southward to Groton, Conn., 62½ miles, of which 50 miles, from Stonington to Providence, are double track; there are 7½ miles of sidings, making 120½ miles of track in all, of which 50½ miles are laid with steel. The company operates a steam ferry between Groton and New London and owns a controlling interest in the Providence & Stonington Steamship Company, whose lines run from Providence and Stonington to New York. The report is for the year ending Sept. 30, 1878.

The equipment consists of 24 engines; 31 passenger and

12 baggage cars and 12 baggage crates; 117 box and 190 flat cars, and 16 gravel cars. The company also owns ¼ of 13 passenger, two postal and 7 baggage cars, run in the Shore Line between Boston and New York, and ¼ of two baggage and 9 passenger cars in the Steamboat train between Stonington and Boston.

The capital stock is \$3,000,000, or \$48,000 per mile. The debt was as follows at the close of the last two fiscal years:

	1878.	1877.
Bonds of 1869.....	\$1,000,000	\$837,000
Extension bonds of 1878 and 1880.....	50,000	250,000
Bonds of 1876.....	75,000	76,000
Bills payable.....	75,000

Total.....\$1,125,000 \$1,163,000
Per mile of road.....18,000 18,608

In addition to the road there are three ferry-boats and ferry property costing over \$250,000; real estate in Providence, Stonington and Groton, and \$804,900 stock in the Providence & Stonington Steamship Company.

The work done was as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Train mileage.....	278,550	278,311	I.	239 0.1
Passenger.....	164,012	165,639	D.	1,627 1.0
Freight.....	110,233	103,240	I.	6,943 6.7
Other.....	552,705	547,240	I.	5,555 1.0
Total.....	552,705	547,240	I.	5,555 1.0

Passengers carried.....567,673 I. 64,089 10.8
Passenger mileage.....17,858,442 I. 2,419,590 16.1
Tons freight carried.....275,745 I. 31,769 12.8
Tonnage mileage.....10,465,601 I. 1,183,995 12.8

Av. train load:
Passengers, No.....64.11 I. 8.85 16.0
Freight, tons.....93.44 I. 7.76 13.9
Av. receipt:
Per passenger per mile.....2.21 cts. I. 0.44 ct. 16.6
Per ton per mile.....2.30 " I. 0.10 " 4.1

Of the freight carried 200,938 tons were through and 78,412 local. Of the passengers, 208,598 were through, 357,472 local, and 96,672 commuters. The average passenger rate, excluding commuters, was 2.41 cents per mile; for commuters, 0.85 cent. The earnings were as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Passengers.....	\$432,085.50	\$380,480.44	I.	\$51,599.06 13.6
Freight.....	207,011.95	313,351.20	D.	46,339.25 14.8
Mails.....	10,941.05	8,835.77	I.	2,105.28 23.9
Rents, etc.....	11,974.28	30,288.33	D.	18,314.05 60.4
Total road earn'.....	\$722,012.78	\$732,961.74	D.	\$10,948.96 1.5
Dividends, P. & S. Co.....	112,086.00	120,735.00	D.	8,649.00 9.7
Total.....	\$834,098.78	\$853,696.74	D.	\$19,597.96 2.3
Expenses.....	436,682.79	494,600.43	D.	58,116.64 11.7
Net earnings.....	\$398,115.99	\$358,997.31	I.	\$39,118.68 10.9

Road earn. per mile.....11,552.20 I. 175.19 1.5
Net earn. per mile.....6,369.86 I. 625.90 10.9
Per cent. of exps.....60.47 I. 7.02 10.4

The income account was as follows, condensed:

Balance, cash assets from last report.....	\$88,651.55
Net receipts.....	398,115.89
Bills payable.....	200,000.00
Receipts from \$163,000 bonds sold.....	188,320.00
Total.....	\$875,087.54
Dividends, 10 per cent.....	\$90,000.00
Interest.....	80,287.35
Bonds paid.....	276,000.00
Total.....	656,287.35

Balance, cash assets, to new account.....\$218,800.19
Expenses were largely reduced, owing partly to a mild winter, and partly to the increasing proportion of steel rails in track. All necessary repairs and renewals have been made and four fast freight-cars built. Earnings were reduced by the low rates resulting from excessive competition on the New York and Boston through business, which has been forced upon this company much against its will.

Long Island.

This company owns a line from Hunter's Point, N. Y., to Greenport, 94.87 miles, with 67.37 miles of branches owned, and 37.63 miles leased. It also leases the Southern Railroad, 51.67 miles, with 19.19 miles of branches, and the Flushing, North Shore & Central, 35.34 miles, with 17.81 miles of branches, making in all 323.88 miles worked. The road is managed by Mr. Thomas R. Sharpe, Receiver, and his report to the New York State Engineer for the year ending Sept. 30 gives the following figures:

The stock and debt at the close of the last two years were as follows:

	1878.	1877.	Increase.
Stock.....	\$3,290,200	\$3,290,200
Funded debt.....	1,841,750	1,853,850	\$12,100
Floating debt.....	1,157,861	952,367	205,494
Total.....	\$6,290,811	\$6,096,417	\$233,394
Cost of road, etc.....	6,160,059	6,116,312	43,747

The traffic of the road was as follows for the year:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Passengers carried.....	4,157,715	3,063,031	I.	1,094,684 35.7
Tons freight carried.....	254,580	272,068	D.	17,506 6.4

The earnings for the year were as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Gross earnings.....	\$1,473,914	\$1,473,178	I.	\$735 0.05
Expenses.....	1,000,019	1,060,477	D.	60,458 5.7
Net earnings.....	\$473,895	\$412,701	I.	\$61,194 14.8
Gross earnings per mile.....	4,625	4,549	I.	76 1.7
Net earnings per mile.....	1,537	1,274	I.	263 20.6
Per cent. of expenses.....	69.76	72.00	D.	2.24 7.3

Payments reported from net earnings were:

Net earnings.....	\$473,895.28
Interest.....	189,606.41
Rentals.....	145,614.20
Construction and equipment.....	126,386.56
On account of funded and old floating debt.....	124,688.73
Total.....	595,295.90

Deficit.....\$95,400.62

Deducting the amount paid for new construction from net earnings there is left a balance of \$371,508.72; construction expenses the previous year were \$688,266.45, leaving a deficit of \$275,565.58. Total payments outside of working expenses in 1876-77 were \$1,298,291.71, leaving a deficit of \$886,590.84 for that year.

New equipment bought included six engines and 13 passenger cars. Since the appointment of the Receiver (Oct. 23, 1877), there has been a large expenditure made by order of the Court for the payment of real estate mortgages, additional rolling stock, opening Front street and alteration of depot at Hunter's Point and depot at Bushwick. To make a connection for the Brighton Beach business, a track was constructed connecting the Long Island Railroad with the Brooklyn & Jamaica Railroad at Berlin. On Atlantic avenue additional gates were required and constructed, and at Flatbush avenue it was necessary to acquire more real estate, and extend the depot facilities and tracks to accommodate the increased business at that point.